

TECHNOLOGY COMPETITIVENESS ACT OF 1987

AUGUST 4, 1987.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. ROE, from the Committee on Science, Space, and Technology,
submitted the following

REPORT

together with

ADDITIONAL VIEWS

[To accompany H.R. 2916]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science, Space, and Technology, to whom was referred the bill (H.R. 2916) to amend the Act of March 3, 1901, and the Stevenson-Wydler Technology Innovation Act of 1980 to further U.S. technological leadership, and for other purposes, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

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The amendment is as follows:

H703-11

Strike out all after the enacting clause and insert in lieu thereof the following:

That this Act may be cited as the "Technology Competitiveness Act of 1987".

TITLE I—NATIONAL INSTITUTES OF STANDARDS AND TECHNOLOGY AND ADVANCED TECHNOLOGY BOARD

SEC. 101. FINDINGS.

The Congress finds and declares the following:

(1) America's manufacturing industries are confronting strong competition in both domestic and world markets. Other industrial countries as well as emerging and developing nations are increasingly taking advantage of skilled labor, modern technology, and favorable government support to produce manufactured products which compete very favorably with those of American industry.

(2) While the United States is modernizing its industrial economy, one key to maintaining and ensuring the future health and wealth of the American economy is a strong manufacturing base.

(3) Precise measurements, calibrations, and quality assurance standards are more important than ever to the health of the United States manufacturing base and to the strength of United States industry in world markets.

(4) Since its establishment, the National Bureau of Standards has been responsible for assisting in the improvement of industrial technology. It has taken a lead role in stimulating cooperative work among private industrial organizations in efforts to surmount technological hurdles. The National Bureau of Standards has served as the national and industry focal point in developing automated manufacturing technologies, improved process sensors for the steel and aluminum industries, more precise construction techniques, textile flammability standards, and the basic measurement standards for the semiconductor industry. The National Bureau of Standards has already begun research and development initiatives in various new technologies, including biotechnology and bioprocessing, advanced ceramics and polymers, and advanced electronics.

SEC. 102. PURPOSE.

It is the purpose of this title—

(1) to rename the National Bureau of Standards and to modernize and restructure that agency to augment its unique ability to enhance the competitiveness of American industry while maintaining its traditional function of providing the measurements, calibrations, and quality assurance techniques which underpin United States commerce;

(2) to promote private sector initiatives to capitalize on advanced technology;

(3) to advance, through cooperative efforts among industries, universities, and government laboratories, the most promising research and development projects, which can be optimized by the private sector for commercial and industrial applications; and

(4) to promote shared risks, accelerated development, and pooling of skills which will be necessary to strengthen America's manufacturing industries.

SEC. 103. NATIONAL INSTITUTES OF STANDARDS AND TECHNOLOGY.

The National Bureau of Standards of the Department of Commerce shall, after the date of the enactment of this Act, be known as the National Institutes of Standards and Technology. References in any other Federal law to the National Bureau of Standards shall be deemed to refer to the National Institutes of Standards and Technology.

SEC. 104. DIRECTOR; POWERS AND DUTIES; REPORTS.

Section 5 of the Act of March 3, 1901 (15 U.S.C. 274) is amended to read as follows.

"Sec. 5. The Director shall be appointed by the President, by and with the advice and consent of the Senate. The Director shall have the general supervision of the National Institutes of Standards and Technology, its equipment, and the exercise of its functions. Before any person is appointed as Director, the President shall afford the Advanced Technology Board established by section 21 an opportunity to make recommendations with respect to such appointment. The Director shall make an annual report to the Secretary of Commerce, including an abstract of the work done during the year and a financial statement. The Director may issue, when necessary, bulletins for public distribution, containing such information as may be of value to the public or facilitate the exercise of the functions of the National Institutes."

SEC. 105. FUNCTIONS AND ACTIVITIES.

(a) IN GENERAL.—Section 2 of the Act of March 3, 1901 (15 U.S.C. 272) is amended to read as follows:

"SEC. 2. (a) There is established within the Department of Commerce and its National Institutes of Standards and Technology four science and technology laboratories, which shall be known as the National Engineering Institute, the National Measurement Institute, the Computer Sciences and Technology Institute, and the Materials Science and Engineering Institute (in this section collectively referred to as the 'Institutes').

"(b) The Institutes are authorized—

"(1) to assist industry in the development of technology and procedures needed to improve quality, to modernize manufacturing processes, to ensure product reliability, manufacturability, functionality, and cost-effectiveness, and to facilitate the more rapid commercialization, especially by small- and medium-sized companies throughout the United States, of products based on new scientific discoveries in fields such as automation, electronics, advanced materials, biotechnology, and optical technologies;

"(2) to develop, maintain, and retain custody of the national standards of measurement, and provide the means and methods for making measurements consistent with those standards, including comparing standards used in scientific investigations, engineering, manufacturing, commerce, industry, and educational institutions with the standards adopted or recognized by the Federal Government;

"(3) to enter into contracts, including cooperative research and development arrangements, in furtherance of the United States industrial competitiveness;

"(4) to provide United States industry, Government, and educational institutions with a national clearinghouse of current information, techniques, and advice for the achievement of higher quality and productivity;

"(5) to assist industry in the development of measurements, measurement methods, and basic measurement technology;

"(6) to determine, compile, evaluate, and disseminate physical constants and the properties and performance of conventional and advanced materials when they are important to science, engineering, manufacturing, education, commerce, and industry and are not available with sufficient accuracy elsewhere;

"(7) to develop a fundamental basis and methods for testing materials, mechanisms, structures, equipment, and systems, including those used by the Federal Government;

"(8) to assure the compatibility of United States national standards with those of other nations;

"(9) to cooperate with other departments and agencies of the Federal Government, with industry, with State and local governments, and with private organizations in establishing standard practices, codes, specifications, and voluntary consensus standards;

"(10) to advise government and industry on scientific and technical problems; and

"(11) to invent, develop, and (when appropriate) promote transfer to the private sector of measurement devices to serve special national needs.

"(c) In carrying out the functions specified in subsection (b), the Institutes may—

"(1) construct physical standards;

"(2) test, calibrate, and certify standards and standard measuring apparatus;

"(3) study and improve instruments, measurement methods, and industrial quality control and quality assurance techniques;

"(4) cooperate with the States in securing uniformity in weights and measures laws and methods of inspection;

"(5) prepare, certify, and sell standard reference materials for use in ensuring the accuracy of chemical analyses and measurements of physical and other properties of materials;

"(6) accept research associates, cash donations, and donated equipment from industry and also engage with industry in research to develop new basic and generic technologies for traditional and new products and for improved production and manufacturing;

"(7) study and develop fundamental scientific understanding and improved measurement, analysis, synthesis, processing, and fabrication methods for chemical substances and compounds, and all traditional and advanced materials, as a function of pressure, temperature, structure, and other appropriate parameters;

"(8) investigate ionizing and nonionizing radiation and radioactive substances, their uses, and ways to protect people, structures, and equipment from their harmful effects;

"(9) determine the atomic and molecular structure of matter, through analysis of spectra and other methods, to provide a basis for predicting chemical and physical structures and reactions and for designing new materials and chemical substances, including biologically active macromolecules;

"(10) perform research on electromagnetic signals, including optical signals, and on properties and performance of electrical, electronic, and electromagnetic devices and systems and their essential materials, develop and maintain related standards, and disseminate standard signals through broadcast and other means;

"(11) develop and test standard interfaces, communication protocols, and data structures for computer, automation, and telecommunications systems;

"(12) study computer systems and their use to control machinery and processes;

"(13) determine properties of building materials and structural elements, and encourage their standardization and most effective use, including investigation of fire-resisting properties of building materials and conditions under which they may be most efficiently used, and the standardization of types of appliances for fire prevention;

"(14) undertake such research in engineering, pure and applied mathematics, statistics, computer science, materials science, and the physical sciences as may be necessary to carry out and support the functions specified in this section;

"(15) investigate conditions which affect the transmission of radio waves from their source to a receiver and the compilation and distribution of information on such transmission of radio waves as a basis for choice of frequencies to be used in radio operations;

"(16) compile, evaluate, publish, and otherwise disseminate general scientific and technical data resulting from the performance of the functions specified in this section or from other sources when such data are important to science, engineering, or industry, or to the general public, and are not available elsewhere;

"(17) collect, create, analyze, and maintain specimens of scientific value;

"(18) operate national user facilities;

"(19) evaluate promising inventions and other novel technical concepts submitted by inventors and small companies and work with other Federal agencies, States, and localities to provide appropriate technical assistance and support for those inventions which are found in the evaluation process to have commercial promise;

"(20) demonstrate the results of the Institutes' activities by exhibits or other methods of technology transfer, including the use of scientific or technical personnel of the Institutes for part-time or intermittent teaching and training activities at educational institutions of higher learning as part of and incidental to their official duties; and

"(21) undertake such other activities similar to those specified in this subsection as the Director determines appropriate."

(b) CONFORMING AMENDMENTS.—The first section of the Act of July 16, 1914 (15 U.S.C. 280), the first section of the Act of March 4, 1913 (15 U.S.C. 281), and the first section of the Act of May 14, 1930 (15 U.S.C. 282), are repealed.

SEC. 106. ESTABLISHMENT OF ADVANCED TECHNOLOGY FOUNDATION.

(a) IN GENERAL.—The Act of March 3, 1901, is amended by adding at the end the following new section:

"Sec. 21. (a) There is established in the National Institutes of Standards and Technology, reporting to the Director, an Advanced Technology Foundation.

"(b) The Foundation is authorized and directed—

"(1) to sponsor programs of applied research with United States industry, universities, and independent research organizations to lay the groundwork for the development and use by United States industry of advanced and innovative manufacturing and process technologies for the purpose of ensuring that United States industries, including small businesses in those industries, are competitive in emerging high technology industries;

"(2) to provide organizational and technical advice, and partial start-up funding where necessary to consortia, which may include United States industry, universities, and independent research organizations, aimed at solving generic problems of specific industries and making those industries more competitive in world markets;

"(3) to provide technical assistance for, and to share in the costs of, collaborative technology demonstration projects managed by consortia of United States industry (which may include universities and independent research organizations), including the installation, testing, and modification of major prototype equipment or processes, or existing equipment or processes in new applications if such arrangements will benefit participating industries generally and will help increase their competitiveness in world markets;

"(4) to carry out all functions, powers, duties, and responsibilities related to the Cooperative Research Centers created under section 6 of the Stevenson-Wydler Technology Innovation Act of 1980; and

"(5) to involve the Federal laboratories in the programs of the Foundation, where appropriate, using among other authorities the cooperative research and development agreements provided for under section 12 of the Stevenson-Wydler Technology Innovation Act of 1980."

(b) **FUNCTIONS OF DIRECTOR.**—The Director shall assure that the advice of the Advanced Technology Board, established by section 21 of the Act of March 3, 1901 (as added by section 108 of this Act), is considered routinely in carrying out the responsibilities of the National Institutes of Standards and Technology, shall take all necessary steps to assure that the programs of the National Institutes are focused on improving the competitive position of the United States and its industries, and shall avoid providing undue advantage to specific companies.

(c) **PURPOSE OF PROJECTS.**—The purpose of the projects selected for funding by the Advanced Technology Foundation shall be to create a competitive advantage for American industry.

(d) **MONITORING AND REPORTS.**—The Advanced Technology Foundation shall monitor how technologies developed in its research program are used, and shall report annually to the Congress on the extent of any overseas manufacturing or technology transfer of these technologies.

SEC. 107. ORGANIZATION PLAN.

(a) **IN GENERAL.**—At least 60 days before its effective date and within 120 days after the date of the enactment of this Act, the Director, after consultation with the Advanced Technology Board, shall submit to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate an initial organization plan for the National Institutes of Standards and Technology. Such plan shall—

(1) assign each of the activities listed in section 2(c) of the Act of March 3, 1901, to at least one of the laboratories established under section 2(a) of that Act;

(2) make recommendations regarding the establishment of additional institutes, if necessary; and

(3) provide details of a 2-year program for the National Institutes of Standards and Technology, including the Advanced Technology Foundation.

(b) **REVISIONS.**—Any revision of the organization plan submitted under subsection (a) shall be submitted to the appropriate committees of the House of Representatives and the Senate at least 60 days before its effective date.

SEC. 108. ESTABLISHMENT OF ADVANCED TECHNOLOGY BOARD.

(a) **IN GENERAL.**—The Act of March 3, 1901, as amended by the preceding provisions of this Act, is further amended by adding at the end the following new sections:

"SEC. 22. (a) There is established within the National Institutes of Standards and Technology an Advanced Technology Board. The Board shall consist of 9 members, at least five of whom shall be from United States industry. They shall be appointed by the President, by and with the advice and consent of the Senate. In addition to any powers and functions otherwise granted to it by this Act, the Board shall review and make recommendations regarding general policy for the National Institutes of Standards and Technology, their organization, their budgets, and their programs within the framework of applicable national policies as set forth by the President and the Congress.

"(b) The persons appointed as members of the Board (1) shall be eminent in the fields of business, labor, research, new product development, engineering, education, management consulting, environment, and international relations; (2) shall be selected solely on the basis of established records of distinguished service; (3) shall not be employees of the Federal Government; and (4) shall be so selected as to provide representation of a cross-section of the traditional and emerging United States industries. The President is requested, in making appointments of persons as members of the Board, to give due consideration to any recommendations which may be

submitted to him by the National Academies, professional societies, business associations, labor associations, and other appropriate organizations.

"(c)(1) The term of office of each member of the Board, other than the original members, shall be 3 years; except that any member appointed to fill a vacancy occurring prior to the expiration of the term for which his predecessor was appointed shall be appointed for the remainder of such term. Any person who has been a member of the Board for 6 consecutive years shall thereafter be ineligible for appointment during the one-year period following the expiration of the 6th year.

"(2) The original members of the Board shall be elected to 3 classes of 3 members each; one class shall have a term of 1 year, one a term of 2 years, and the other a term of 3 years.

"(d) The Board shall meet at least quarterly at the call of the Chairman or whenever one-third of the members so request in writing. A majority of the members of the Board not having a conflict of interest in the matter being considered by the Board shall constitute a quorum. Each member shall be given appropriate notice, whenever possible, not less than 15 days prior to any meeting, of the call of such meeting.

"(e) The Board shall have an executive committee, and may delegate to it or to the Secretary such of the powers and functions granted to the Board by this Act as it deems appropriate. The Board is authorized to appoint from among its members such other committees as it deems necessary, and to assign to committees so appointed such survey and advisory functions as the Board deems appropriate to assist it in exercising its powers and functions under this Act.

"(f) The election of the Chairman and Vice Chairman of the Board shall take place at each annual meeting occurring in an even-numbered year. The Vice Chairman shall perform the duties of the Chairman in his absence. In case a vacancy occurs in the chairmanship or vice chairmanship, the Board shall elect a member to fill such vacancy.

"(g) The Board may, with the concurrence of a majority of its members, permit the appointment of a staff consisting of not more than 4 professional staff members and such clerical staff members as may be necessary. Such staff shall be appointed by the Director of the National Institutes, after consultation with the Chairman of the Board, and assigned at the direction of the Board. The professional members of such staff may be appointed without regard to the provisions of title 5, United States Code, governing appointments in the competitive service and the provisions of chapter 51 of title 5 of such Code relating to classification, and compensated at a rate not exceeding the appropriate rate provided for individuals in grade GS-18 of the General Schedule under section 5332 of title 5 of such Code, as may be necessary to provide for the performance of such duties as may be prescribed by the Board in connection with the exercise of its powers and functions under this Act.

"(h) The Board is authorized to establish such special commissions as it may from time to time deem necessary for the purposes of this Act.

"(i)(1) The Board shall render an annual report to the President, for submission to the Congress on or before January 31 in each year. Such report shall deal essentially, though not necessarily exclusively, with policy issues or matters which affect the National Institutes of Standards and Technology including the Advanced Technology Foundation or with which the Board in its official role as the private sector policy advisor of the National Institutes of Standards and Technology is concerned.

"(2) The Board shall render to the President and the Congress such additional reports on specific policy matters as it deems appropriate."

(b) CONFORMING AMENDMENT.—Section 10 of the Act of March 3, 1901, is repealed.

SEC. 109. INVENTION PROGRAM PLAN.

As a part of the fiscal year 1989 budget submission for the National Institutes of Standards and Technology, the Secretary of Commerce shall submit to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate a plan to supplement existing activities by providing for the evaluation by the National Institutes of Standards and Technology of the technological and economic feasibility of inventions which are not energy-related. The plan shall include specific cost estimates, implementation schedules, and mechanisms to help finance the development of technologies the program has determined to have potential. Such funding may be provided by the Advanced Technology Foundation, pursuant to section 20(b)(1) of the Act of March 3, 1901. In the preparation of the plan, the Director shall consult with appropriate Federal agencies including the Small Business Administration, State and local government organizations, university officials, and private sector organiza-

tions in order to obtain advice on how those agencies and organizations might cooperate with the expanded inventions evaluation program.

SEC. 110. AUTHORIZATION.

There is authorized to be appropriated, for the fiscal year 1988, \$10,000,000 for the purposes of this title other than section 105.

TITLE II—EXTENSION SERVICES

SEC. 201. SHORT TITLE.

This title may be cited as the "Federal Industrial Extension Act of 1987".

SEC. 202. FINDINGS.

The Congress finds that—

- (1) the ability of American industry to compete in the international marketplace is essential;
- (2) greater industrial application of the latest advances in science and technology would help enhance American industry's competitiveness;
- (3) State programs that work directly with companies to promote the appropriate use of state-of-the-art science and technology have proven to be an effective means of modernizing American companies, particularly small- and medium-sized manufacturers;
- (4) such State programs are an effective means of disseminating the results of federally funded research; and
- (5) universities, colleges, and technical institutes, through their teaching, research, and extension staffs, have been an integral part of many of the most successful of the State programs.

SEC. 203. PURPOSE.

It is the purpose of this title to require a review of current State industrial extension programs and to determine an appropriate Federal role in encouraging such programs.

SEC. 204. STUDY AND RECOMMENDATIONS.

(a) The Secretary shall conduct a nationwide study of current State industrial extension programs. The study shall include—

- (1) a thorough description of each State program, including its duration, its annual budget, and the number and types of businesses it has aided;
- (2) a description of any anticipated expansion of each State program and its associated costs;
- (3) an evaluation of the success of the programs in transferring technology, modernizing manufacturing processes, and improving the productivity and profitability of businesses;
- (4) an assessment of the degree to which State programs make use of Federal programs, including the Small Business Innovative Research program and the programs of the Federal Laboratory Consortium, the National Technical Information Service, the National Science Foundation, the Office of Productivity, Technology, and Innovation, and the Small Business Administration;
- (5) a survey of what additional Federal information and technical assistance the programs could utilize; and
- (6) an assessment of how the programs could be more effective agents for the transfer of Federal scientific and technical information, including the results and application of Federal and federally funded research.

(b) The Secretary shall submit the results of the study to the House Committee on Science, Space, and Technology and the Senate Committee on Commerce, Science, and Transportation by February 1, 1988.

(c) Along with the study, the Secretary shall submit his recommendations on what Federal actions should be taken to make the State programs more effective instruments of Federal technology transfer, including but not limited to the provision of technical and financial assistance. The recommendations shall include cost estimates.

(d) In making his recommendations, the Secretary shall consider the experience of previous Federal programs for this purpose, including the State Technical Services Act of 1965.

(e) No plan to assist State programs may be implemented without providing at least 60 days notice to the House Committee on Science, Space, and Technology and the Senate Committee on Commerce, Science, and Transportation.

(f) The Secretary may make use of contractors and experts for any or all of the studies and findings called for in this section.

SEC. 205. AUTHORIZATION OF APPROPRIATIONS.

There are authorized to be appropriated to carry out the purposes of this title—

- (1) such sums as may be necessary for fiscal year 1988 to conduct the study provided for in section 204; and
- (2) such sums as may be necessary, not to exceed \$16,000,000 for each of the three fiscal years 1989, 1990, and 1991, to create programs pursuant to the Secretary's recommendations made under section 204(c).

SEC. 206. DEFINITIONS.

As used in this title—

(1) the term "State industrial extension program" means a State program designed to help industry, particularly small- and medium-sized industry, to enhance their competitiveness through the application of the latest science and technology, utilizing for this purpose—

- (A) extension agents who work with specific companies to improve their operations;
 - (B) workshops and seminars to disseminate scientific, managerial, and technical information, and
 - (C) other methods of working directly with industry to enable it to adapt science and technology to their operations; and
- (2) the term "Secretary" means the Secretary of Commerce.

TITLE III—REPORTS ON SUPERCONDUCTORS

SEC. 301. REVIEW OF RESEARCH AND DEVELOPMENT PRIORITIES IN SUPERCONDUCTORS.

(a) **IN GENERAL.**—The President shall appoint a National Commission on Superconductivity to review all major policy issues regarding United States applications of recent research advances in superconductors in order to assist the Congress in devising a national strategy, including research and development priorities, the development of which will assure United States leadership in the development and application of superconducting technologies.

(b) **MEMBERSHIP.**—The membership of the National Commission on Superconductivity shall include representatives of—

(1) the National Critical Materials Council, the National Academy of Sciences, the National Academy of Engineering, the National Science Foundation, the National Aeronautics and Space Administration, the Department of Energy, the Department of Justice, the Department of Commerce (including the National Institutes of Standards and Technology), the Department of Transportation, and the Department of Defense;

(2) organizations whose membership is comprised of physicists, engineers, chemical scientists, and material scientists; and

(3) industries, universities, and national laboratories engaged in superconductivity research.

(c) **COORDINATION.**—The National Critical Materials Council shall be the coordinating body of the National Commission on Superconductivity.

(d) **REPORT.**—Within 6 months after the date of the enactment of this Act, the National Commission on Superconductivity shall submit a report to the President and the Congress with recommendations regarding methods of enhancing the research, development, and implementation of improved superconductor technologies in all major applications. Upon submitting its report and recommendations under the preceding sentence the Commission shall disband, and the National Critical Materials Council may review and update such report and recommendations as it deems appropriate.

(e) **SCOPE OF REVIEW.**—In preparing the report required by subsection (d), the Commission shall consider addressing, but need not limit, its review to—

(1) the state of United States competitiveness in the development of improved superconductors;

(2) methods to improve and coordinate the collection and dissemination of research data relating to superconductivity;

(3) the appropriateness and scope of United States efforts regarding research on and development of improved superconductors and the level of consultation among United States organizations doing research in this field;

(4) methods to improve and coordinate the development of viable applications of improved superconductors;

(5) foreign government activities designed to promote research, development, and application of improved superconductors;

(6) the need to provide increased Federal funding of research and development of improved superconductors;

(7) the impact on the United States national security if the United States must rely on foreign producers of superconductors; and

(8) any statutory changes that would increase the likelihood that applications of promising superconductivity technologies will occur within the United States.

TITLE IV—CLEARINGHOUSE FOR STATE AND LOCAL INITIATIVES ON PRODUCTIVITY, TECHNOLOGY, AND INNOVATION

SEC. 401. SHORT TITLE.

This title may be cited as the "Competitiveness Enhancement Act of 1987".

SEC. 402. ESTABLISHMENT OF CLEARINGHOUSE.

(a) **ESTABLISHMENT.**—The Stevenson-Wydler Technology Innovation Act of 1980 is amended by inserting after section 5 the following new section:

"SEC. 5A. CLEARINGHOUSE FOR STATE AND LOCAL INITIATIVES ON PRODUCTIVITY, TECHNOLOGY, AND INNOVATION.

"(a) **ESTABLISHMENT.**—There is established in the Office of Productivity, Technology, and Innovation a Clearinghouse for State and Local Initiatives on Productivity, Technology, and Innovation. The Clearinghouse shall serve as a central repository of information on initiatives by State and local governments to enhance the competitiveness of American businesses and industry through the stimulation of productivity, technology, and innovation and on Federal efforts to assist State and local governments to enhance competitiveness.

"(b) **RESPONSIBILITIES.**—The Clearinghouse may—

"(1) establish relationships with State and local governments, and regional and multistate organizations of such governments, which carry out such initiatives;

"(2) collect information on the nature, extent, and effects of such initiatives, particularly information useful to Federal agencies, State and local governments, and businesses throughout the United States;

"(3) disseminate information collected under paragraph (2) to Congress, Federal agencies, State and local government agencies, and the public through reports, directories, handbooks, conferences, and seminars;

"(4) study ways in which Federal agencies, including Federal laboratories, can provide assistance to State and local governments to enhance the competitiveness of American business;

"(5) make periodic recommendations to the Secretary of Commerce, and upon request to other Federal agencies, concerning modifications in Federal policies and programs which would improve Federal assistance to State and local technology programs;

"(6) developing methodologies to evaluate State and local programs, and, when requested, advise State and local governments, and regional and multistate organizations of such governments, as to which programs are most effective in enhancing the competitiveness of American business through the stimulation of productivity, technology, and innovation; and

"(7) make use of, and disseminate, the study required by section 204(a) of the Technology Competitiveness Act of 1987.

"(c) **ANNUAL REPORT.**—The Secretary shall prepare and transmit to the Congress an annual report on initiatives by State and local governments to enhance the competitiveness of American businesses through the stimulation of productivity, technology, and innovation. The report shall include recommendations to the President, the Congress, and to Federal agencies on the appropriate Federal role in stimulating State and local efforts in this area.

"(d) **AUTHORIZATION OF APPROPRIATIONS.**—To carry out this section, there are authorized to be appropriated \$500,000 for the fiscal year 1988, \$1,000,000 for the fiscal year 1989, and \$1,500,000 for the fiscal year 1990 and each succeeding fiscal year. Amounts appropriated under this subsection shall remain available until expended."

(b) **DEFINITION.**—Section 4 of such Act is amended by adding at the end thereof the following new paragraph:

"(13) 'Clearinghouse' means the Clearinghouse for State and Local Initiatives on Productivity, Technology, and Innovation established by section 5A."

TITLE V—SEMICONDUCTOR RESEARCH AND DEVELOPMENT

SEC. 501. SHORT TITLE.

This title may be cited as the "National Advisory Committee on Semiconductor Research and Development Act of 1987".

SEC. 502. PURPOSES.

(a) **GENERAL FINDINGS.**—The Congress finds and declares that—

- (1) our future economic status is firmly wedded to leadership in the high technology industries that depend upon semiconductors;
- (2) the leadership position of this country in high technology areas is threatened by the changing nature of foreign competition which is often strongly supported by the national governments involved;
- (3) our national defense is highly dependent upon the availability of leading edge semiconductor devices, and it is counter to the national interest to be dependent upon foreign sources for this technology;
- (4) governmental actions to address these issues are fragmented in many Federal departments and agencies; and
- (5) responses to these challenges require concerted actions of industry and government.

(b) **SPECIFIC PURPOSES.**—The purposes of this title are—

- (1) to establish the National Advisory Committee on Semiconductors; and
- (2) to assign to such Committee the responsibility for devising and promulgating a national semiconductor strategy, including research and development, the implementation of which will assure the continued leadership of the United States in semiconductor technology.

SEC. 503. ESTABLISHMENT OF THE NATIONAL ADVISORY COMMITTEE ON SEMICONDUCTORS.

There is hereby created in the executive branch of the Government an independent advisory body to be known as the National Advisory Committee on Semiconductors (hereinafter referred to as the "Committee").

SEC. 504. FUNCTIONS OF THE COMMITTEE.

(a) **IN GENERAL.**—The Committee shall—

- (1) collect and analyze information on the needs and capabilities of industry, the Federal Government, and the scientific and research communities related to semiconductor technology;
- (2) identify the components of a successful national semiconductor strategy in accordance with section 502(b)(2);
- (3) analyze options, establish priorities, and recommend roles for participants in the national strategy;
- (4) assess the roles for government and national laboratories and other laboratories supported largely for government purposes in contributing to the semiconductor technology base of the Nation, as well as to access the effective use of the resources of United States private industry, United States universities, and private-public research and development efforts; and
- (5) provide results and recommendations to agencies of the Federal Government involved in legislative, policymaking, administrative, management, planning, and technology activities that affect or are part of a national semiconductor strategy, and to the industry and other nongovernmental groups or organizations affected by or contributing to that strategy.

(b) **SPECIFIC FUNCTIONS.**—In fulfilling this responsibility, the Committee shall—

- (1) monitor the competitiveness of the United States semiconductor technology base;
- (2) determine technical areas where United States semiconductor technology is deficient relative to international competition;
- (3) identify new or emerging semiconductor technologies that will impact the national defense or United States competitiveness or both;
- (4) develop research and development strategies, tactics, and plans whose execution will assure United States semiconductor competitiveness; and
- (5) recommend appropriate actions that support the national semiconductor strategy.

SEC. 505. ORGANIZATIONAL AND ADMINISTRATIVE PROVISIONS.

(a) **MEMBERSHIP.**—(1) The Committee shall be composed of 13 members, 7 of whom shall constitute a quorum.

(2) The Secretary of Defense, the Secretary of Commerce, the Secretary of Energy, the Director of the Office of Science and Technology Policy, and the Director of the

National Science Foundation, or their designees, shall serve as members of the Committee.

(3) The President shall appoint, as additional members of the Committee, 4 members from outside the Federal Government who are eminent in the semiconductor industry, and 4 members from outside the Federal Government who are eminent in the fields of technology, defense, and economic development.

(4) One of the members appointed under paragraph (3), as designated by the President at the time of appointment, shall be chairman of the Committee.

(b) **STAFF SUPPORT.**—Administrative support for the Committee shall be provided through an arrangement with an appropriate agency or organization designated by the Committee. The funds necessary for such support shall be provided to the designated agency or organization, from sums available to the Committee to carry out the purposes of this title, in accordance with a memorandum of understanding entered into between them.

(c) **EXPENSES.**—Members of the Committee, other than full-time employees of the Federal Government, while attending meetings of the Committee or otherwise performing duties at the request of the Chairman while away from their homes or regular places of business, shall be allowed travel expenses in accordance with subchapter I of chapter 57 of title 5, United States Code.

(d) **FIRST MEETING.**—The Chairman shall call the first meeting of the Committee not later than 90 days after the date of the enactment of this Act.

(e) **REPORTS.**—At the close of each fiscal year the Committee shall submit to the President and the Congress a report on its activities conducted during such year and its planned activities for the coming year, including specific findings and recommendations with respect to the national semiconductor strategy devised and promulgated under section 502(b)(2). Each report shall include an estimate of the length of time the Committee must continue before the achievement of its purposes and the issuance of its final report.

SEC. 506. AUTHORIZATION OF APPROPRIATIONS.

There are authorized to be appropriated to carry out the purposes of this title such sums as may be necessary for the fiscal years 1988, 1989, and 1990. Appropriations for any fiscal year pursuant to the preceding sentence shall be made through a specific line item in the Act making appropriations to the National Science Foundation for that year.

TITLE VI—METRIC USAGE

SEC. 601. SHORT TITLE.

This title may be cited as the "Metric Usage Act of 1987".

SEC. 602. FINDINGS.

Section 2 of the Metric Conversion Act of 1975 is amended by adding at the end thereof the following new paragraphs:

"(3) World trade is increasingly geared towards the metric system of measurement.

"(4) Industry in the United States is often at a competitive disadvantage when dealing in international markets because of its cumbersome, nonstandard measurement system, and is sometimes excluded when it is unable to deliver goods which are measured in metric terms.

"(5) The inherent simplicity of the metric system of measurement and standardization of weights and measures has led to major cost savings in certain industries which have converted to that system.

"(6) The Federal Government has a responsibility to develop procedures and techniques to assist industry as it voluntarily converts to the metric system of measurement.

"(7) The metric system of measurement can provide substantial advantages to the Federal Government in its own operations."

SEC. 603. POLICY.

Section 3 of the Metric Conversion Act of 1975 is amended to read as follows:

"Sec. 3. It is therefore the declared policy of the United States—

"(1) to designate the metric system of measurement as the preferred system of weights and measures for United States trade and commerce;

"(2) to require that each Federal agency, by a date certain and to the extent feasible by the end of the fiscal year 1992, use the metric system of measurement in its procurements, grants, and other business-related activities, except to

the extent that such use is impractical or is likely to cause significant inefficiencies or loss of markets to United States firms;

"(3) to seek out ways to increase understanding of the metric system of measurement through educational information and guidance and in Government publications; and

"(4) to permit the continued use of traditional systems of weights and measures in nonbusiness activities."

SEC. 604. IMPLEMENTATION.

The Metric Conversion Act of 1975 is further amended by redesignating section 12 as section 13, and by inserting after section 11 the following new section:

"Sec. 12. (a) As soon as possible after the date of the enactment of this section, each agency of the Federal Government shall establish guidelines to carry out the policy set forth in section 3 (with particular emphasis upon the policy set forth in paragraph (2) of that section), and as a part of its annual budget submission for each fiscal year beginning after such date shall report to the Congress on the actions which it has taken during the previous fiscal year, as well as the actions which it plans for the fiscal year involved, to implement fully the metric system of measurement in accordance with that policy. Such reporting shall cease for an agency in the fiscal year after it has fully implemented its efforts under section 3(2). As used in this section, the term 'agency of the Federal Government' means an Executive agency or military department as those terms are defined in chapter 1 of title 5, United States Code.

"(b) At the end of the fiscal year 1992, the Comptroller General shall review the implementation of this Act as amended by the Metric Usage Act of 1987, and upon completion of such review shall report his findings to the Congress along with any legislative recommendations he may have."

TITLE VII—MISCELLANEOUS AND CONFORMING PROVISIONS

SEC. 701. DISTRIBUTION OF ROYALTIES UNDER STEVENSON-WYDLER ACT.

The first sentence of section 13(a)(4) of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3710c) is amended by striking out "shall" and inserting in lieu thereof "may", and by striking out "such invention performed at the request of the other agency or laboratory" and inserting in lieu thereof "any invention of the other agency".

SEC. 702. FEDERAL LABORATORY CONSORTIUM ADJUSTMENT.

Section 10(e)(7)(A) of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3710) is amended by striking out "0.005 percent of that portion of the research and development budget of each Federal agency that is to be utilized by" and inserting in lieu thereof "0.008 percent of the budget of each Federal agency from any Federal source, including related overhead, that is to be utilized by or on behalf of".

SEC. 703. COMMERCIAL AND TECHNOLOGICAL INNOVATION.

(a) Section 5(c) of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3704) is amended by inserting after paragraph (6) the following new paragraph and redesignating the succeeding paragraphs accordingly:

"(7) analyze the concept of competitiveness impact reviews to identify impediments, including legal, regulatory, and legislative impediments and barriers, to the commercialization of United States science and technology advances;"

(b) Section 5(e) of such Act is amended by striking out the period at the end and inserting in lieu thereof the following: ", and shall issue additional reports whenever deemed appropriate. The Secretary shall submit the initial report regarding the analysis of competitiveness impact reviews required by subsection (c)(7) no later than September 30, 1988."

II. PURPOSE OF THE BILL

The primary purpose of the bill is to strengthen U.S. industry's competitive position in world markets by improving the ability of the Department of Commerce's technology programs and technology transfer programs to respond directly to the needs of business and also to state and local government units which promote industry. Other titles provide for study of the appropriate federal role in superconductor and semiconductor technologies and make techni-

cal amendments to existing law including the Federal Technology Transfer Act of 1986.

III. BACKGROUND AND NEED

Technology plays an important role in international competitiveness and trade because the development and application of technology to create new products and services is essential for maintaining a growing economy and a high standard of living. Technological advance creates industries and jobs and improves productivity. The report of the President's Commission on Industrial Competitiveness said that "... competitive success in many industries today is as much a matter of mastering the most advanced manufacturing processes as it is in pioneering new products."

America's manufacturing industries are confronting strong competition in both domestic and world markets. Other industrial countries, as well as emerging and developing nations, are increasingly taking advantage of skilled labor, modern technology, and government support to produce manufactured products which compete very favorably with those of American industry. In terms of the ability of the United States to compete in the technological arena, the utilization of technology and diffusion of products and processes stand out as significant problems. The success of basic research in the United States, is exemplified by the number of Nobel prizes awarded to Americans. However, other countries, such as Japan and Korea, have been very successful in commercializing the results of research and development (R&D). They have created an environment in which the adoption and/or adaptation of new ideas to commercial interests is facilitated. To help American industry meet the competitive challenge, more attention must be given to attacking generic problems and policies which hinder the competitiveness of specific U.S. industries or American manufacturing in general.

Since its establishment, the National Bureau of Standards (NBS) has worked closely with all segments of U.S. industry to develop the standards, protocols, accurate data, and measurements needed by U.S. industry to manufacture quality products. NBS also has taken a lead role in stimulating cooperative work among private industrial organizations. The Bureau has served as the national and industry focal point in the adaptation of automated manufacturing technologies to flexible manufacturing and the factory of the future. It is the one federal laboratory with an explicit mission to aid U.S. industry. Witnesses at numerous hearings, on innovation and technology, held by the Subcommittee on Science, Research and Technology have expressed the need to expand the role of the National Bureau of Standards to permit adequate resources to carry out its basic measurement mission more effectively, while addressing a broader spectrum of the technology issues now confronting our Nation.

IV. LEGISLATIVE HISTORY

The Subcommittee on Science, Research and Technology held legislative hearings on April 28, 29, and 30, 1987 on the Role of Science and Technology in Competitiveness, including legislation intro-

duced related to that issue. Legislation designed to revamp the organization of federal technology agencies, to promote the metric system, to develop a federal semiconductor policy, and to improve domestic technology transfer were all considered. Specifically, testimony was received on S. 907, the Technology Competitiveness Act of 1987, introduced by Senator Hollings; H.R. 2165, the National Policy and Technology Foundation Act of 1987, introduced by Mr. Brown of California; H.R. 2068, the National Bureau of Standards and Industrial Competitiveness Act of 1987, introduced by Mr. Ritter; H.R. 2164, the Department of Science and Technology Act of 1987, introduced by Mr. Brown; H.R. 1964, the Metric Usage Act of 1987, introduced by Mr. Brown; H.R. 2492, the Federal Industrial Extension Act of 1987, introduced by Mr. Boehlert and Mr. MacKay; H.R. 2219, the Competitiveness Enhancement Act of 1987, introduced by Miss Schneider and Mr. Walgren; and H.R. 2191, the National Advisory Committee on Semiconductor Research and Development Act of 1987, introduced by Mr. Valentine. H.R. 2069, the Superconductivity Competition Act of 1987, introduced by Mr. Ritter, was considered during full committee hearings on superconductivity developments on June 10, 1987.

As a result of the hearings, H.R. 2916, the Technology Competitiveness Act of 1987, was developed and introduced on July 13, 1987 by Congressman Roe, with Representatives Walgren, Boehlert, Brown of California, Scheuer, Lloyd, Schneider, Glickman, Volkmer, Nelson of Florida, Hall of Texas, McCurdy, Mineta, Henry, MacKay, Valentine, Bruce, Stallings, Traficant, Morella, Chapman, Hamilton, Perkins, Price of North Carolina, Nagle, Skaggs, and Boucher as cosponsors. The bill was referred to the Committee on Science, Space and Technology and subsequently to the Subcommittee on Science, Research and Technology. The Subcommittee held a markup of H.R. 2916 on July 14, 1987 and reported the bill, as amended, by voice vote, to the Committee on Science, Space, and Technology.

The bill was reported by the Committee on Science, Space and Technology on July 23, 1987 by voice vote with an amendment in the nature of a substitute. Representatives Lujan, Ritter, Torricelli, Buechner, Nowak, McMillen, and Hayes have subsequently cosponsored the bill. As reported, H.R. 2916 incorporates many provisions from the bills considered by the Committee and Subcommittee. The reported version includes the following: a revision of the text from H.R. 2492; the text as amended from H.R. 2191; a revised version of H.R. 2219; a revised version of H.R. 1964; and provisions from H.R. 2068, H.R. 2165, and H.R. 2069.

In many of its provisions, H.R. 2916 closely parallels S. 907, the Senate companion bill. S. 907 was introduced by Senators Hollings and Riegle on April 3, 1987 and was ordered reported by the Senate Commerce Committee on June 16, 1987. S. 907 was incorporated as Title XLI through XLV of S. 1420, the Omnibus Trade and Competitiveness Act of 1987, which passed the Senate on July 21, 1987.

V. MAJOR PROVISIONS OF H.R. 2916, AS REPORTED

The purpose of the Technology Competitiveness Act of 1987 is to strengthen U.S. industry's competitive position in world markets

by improving the ability of the Department of Commerce's technology and technology transfer programs to respond to the specific needs of small and medium-sized businesses, state and local government units, that promote U.S. industry, and industries such as the semiconductor industry or steel industry which have been placed at a competitive disadvantage by foreign government practices. Each of the bill's titles either restructures or expands technology programs of the Department of Commerce or provides for the study or implementation of government-wide programs or policies which have a major impact on the competitiveness of U.S. industry in world markets.

Title 1 establishes the National Institutes of Standards and Technology and the Advanced Technology Board. This title renames the National Bureau of Standards (NBS) as the National Institutes of Standards and Technology (NIST) and each of its four major operating units is designated as an Institute. The NBS Organic Act, enacted in 1901, is updated to reflect current programs being pursued at NBS, such as automated manufacturing, superconductivity, and biotechnology, which were not in existence when NBS was established. The title also establishes an Advanced Technology Foundation within NIST, which serves as a focal point for cooperation between the public and private sectors in the development of industrial technology. An Advanced Technology Board with broad representation from U.S. industry replaces the Visiting Committee as the statutory advisory committee for the Institutes. The sum of \$10 million is authorized for FY 1988 to carry out the new activities of NIST.

Title 2 requires a report by the Secretary of Commerce describing and evaluating current state industrial extension programs. The report is due on February 1, 1988, along with the Secretary's recommendation on how the Federal Government could encourage state efforts. The title authorizes such sums as may be necessary for fiscal year 1988 to conduct the study and up to \$16 million per year in fiscal years 1989, 1990, and 1991 to implement programs to assist state industrial extension.

Title 3 requires the President to appoint a National Commission on Superconductivity to review major policy issues related to recent advances in superconductor research. A report by the Commission is required to be submitted to the President and the Congress within 6 months after enactment of the bill. The purpose of the study is to assist the Congress in devising a national strategy in superconducting technologies.

Title 4 is based on H.R. 2219, the Competitiveness Enhancement Act of 1987, introduced by Representatives Schneider and Walgren, which establishes a Clearinghouse for State and Local Initiatives in the Office of Productivity, Technology, and Innovation. The Clearinghouse would collect and disseminate information on federal, state, and local technology initiatives. The cost of the program is \$.5 million in FY 1988, \$1 million in FY 1989, and \$1.5 million in FY 1990. An annual report to the Congress is required of the Secretary of Commerce.

Title 5 makes only minor changes in the text of H.R. 2191, the National Advisory Committee on Semiconductor Research and Development Act of 1987, introduced by Congressman Valentine. This

title creates a 13-member independent advisory body known as the National Advisory Committee on Semiconductors to monitor the semiconductor industry and recommend a national strategy to ensure U.S. competitiveness in the semiconductor industry. The main objective of this initiative is to reestablish U.S. leadership in semiconductor technology. Annual reports are required to be submitted to the President and the Congress on the Committee's activities. Such sums as necessary are authorized to be appropriated for fiscal year 1988, 1989, and 1990.

Title 6 establishes metric as the preferred system of measurement for United States trade and commerce and provides for use of the metric system of measurement in federal programs and procurements, where appropriate.

Title 7 makes three changes in the Stevenson-Wydler Act of 1980 as amended. Section 14(a)(4), dealing with the licensing of inventions, is reworded to permit the patent licensing program of the National Technical Information Service to receive, in a timely manner, the revenues it needs to continue its traditional program of providing world-wide patent licensing services to other government agencies. The Federal Laboratory Consortium's funding formula is adjusted to ensure that the organization receives the level of funding Congress intended for its responsibilities. Finally, the Office of Productivity, Technology, and Innovation of the Department of Commerce is required to study the concept of Competitiveness Impact Reviews and to report back on its conclusions by September 30, 1988.

VI. SECTION-BY-SECTION ANALYSIS

TITLE 1

This title changes the name of the National Bureau of Standards to the National Institute of Standards and Technology reflecting the enhanced role and responsibility assigned to the Bureau.

Section 101

This section of findings emphasizes the importance of a strong manufacturing base to a healthy American economy and the importance of precise measurements, calibrations and quality assurance standards to retaining that base. It takes note of the National Bureau of Standards' (NBS) contributions to improve industrial technology and to the research and development base which permit improvements to the nation's measurement system.

Section 102

This section explains the purposes behind the changes made to the National Bureau of Standards by the rest of the title. The major changes are the augmentation of NBS's unique ability to enhance the competitiveness of U.S. industry, the promotion of private sector initiatives to capitalize on advanced technology, and the advancement of cooperative research efforts among industries, universities, and other non-profit organizations, and government laboratories.

Section 103

This section renames the National Bureau of Standards as the National Institutes of Standards and Technology (NIST) and states that references to NBS in existing law shall be deemed to refer to the Institutes. The bill, as introduced, was amended to include the words "Standards" in the new name for the Bureau. This, and changes in the text of the bill, stress the Bureau's traditional function of providing the measurements, calibrations and quality assurance standards which underpin United States commerce. The Committee recognizes the great potential of the National Institutes of Standards and Technology in disseminating its knowledge of quality and manufacturing technology throughout the economy. The Bureau's long history of assisting industry must now be used as the foundation of an aggressive program to encourage industrial modernization efforts. Therefore, the Committee is concerned that the Bureau's primary mission to support the national measurement system not be diminished and the associated technical programs not lose their identity during this period of expanding responsibilities and focusing of the Bureau and the nation on competitiveness. The Bureau's fundamental measurement research and standards activities are vital to the progress of science and are crucial to our nation's effort to enhance productivity, to introduce new technologies, and to meet the competitive challenge in international markets.

Section 104

This section calls for the appointment of a Director of the National Institutes of Standards and Technology by the President, by and with the advice and consent of the Senate. The NIST Director is to serve at the pleasure of the President for an unlimited period. This approach is currently used by NBS and is traditional for a number of the other technical agencies such as the National Institutes of Health, where unique technical competence and management skills are vital to the success of the agency.

Section 105

This section renames the four current laboratories of the NBS as Institutes of the National Institutes of Standards and Technology. The National Engineering Laboratory becomes the National Engineering Institute. The National Measurement Laboratory becomes the National Measurement Institute. The Institute for Computer Sciences and Technology becomes the Computer Sciences and Technology Institute.

The Institute for Materials Science and Engineering becomes the Materials Science and Engineering Institute. Section 105 also updates the NBS Organic Act, enacted in 1901, to reflect current programs being pursued at NBS, such as automated manufacturing, superconductivity, and biotechnology, which did not exist when NBS was established.

NIST is specifically required to carry out every function now assigned to NBS including all of its functions as the Nation's national standards and measurement laboratory. At the same time, the newer functions of NBS are highlighted. Permission to assist indus-

try in improving product quality, modernizing manufacturing processes, ensuring product reliability, manufacturability, functionality, and cost-effectiveness and facilitating the more rapid commercialization, especially by small and medium-sized companies throughout the United States is added to the agency's charter. The rewording of the statute significantly expands the role of the NIST as the government's lead laboratory in support of U.S. industrial quality and competitiveness while retaining and encouraging growth and modernization of the core metrology mission. It will permit the NIST to build on its pioneering efforts in these areas, such as the NBS Automated Manufacturing program, corrosion studies, and fracture research.

Section 106

This section establishes an advanced Technology Foundation within the National Institutes of Standards and Technology, which would serve as a focal point for cooperation between the public and private sectors in the development of industrial technology.

The Advanced Technology Foundation (ATF) of the National Institutes of Standards and Technology is created to provide a quick response mechanism for federal support in the solution of generic problems facing United States industries and to provide a competitive advantage for American industry. Like other foundation, the ATF is to be staffed by a relatively small contingent of grant and contract officers and other professionals, preferably with extensive private sector business experience. It is not intended that the ATF develop in-house bureaucracies with extensive expertise in all aspects of specific industries. Rather, the ATF's professionals are to look for means of helping representatives of specific industries solve their own problems by drawing on expertise within the Federal Government such as at the mission agencies or federal laboratories or from any and all portions of the private sector. The Foundation is also expected to note how technologies developed in research programs of its contractors are used and to report to the Congress on overseas manufacturing and international licensing or use of these technologies.

It is assumed that proposals considered by the ATF will have general support within affected industries and that the results of the ATF's work will be generally available to all interested U.S. controlled firms. The statute, therefore, places strong emphasis on working with consortia of U.S. industry, both in their start-up and problem-solving phases.

The Foundation is authorized to assist with collaborative technology demonstration projects managed by consortia of U.S. industry. These programs are most likely to be successful when industrial participants have a large enough financial stake that both the progress and results of the projects are seriously considered by the senior management of companies performing the work. Situations where companies undertake the research primarily to make a fee or to preserve a team of researchers within the company at little or no cost or without serious commitment to commercialize the results of the research, are to be avoided. Absent significant cost-sharing, the commitment to utilization of the resultant technology is much less likely. Emphasis is on major projects in pre-commer-

cial phases and on improvement of processes in instances where several companies with pooled resources are more able to solve major common production problems than one company alone.

Although the ATF is not precluded from awarding grants or contracts to individual companies, its purpose with one exception is to aid in generic problem-solving rather than the promotion of individual companies. Specific aid in the form of technical support and small cash awards or contracts may be given by the Foundation in support of those technologies judged to have merit after a thorough review by the Inventions Program of the National Institutes of Standards and Technology discussed in Section 109.

Section 107

This section requires the Director of the NIST to submit an initial organization plan for the NIST to the Congress within 120 days of enactment and at least 60 days before the plan becomes final. This plan will distribute the functions of the NIST among its institutes and the Advanced Technology Foundation and recommend the establishment of additional institutes if the Director finds them to be necessary. It is assumed that as the U.S. industrial base changes, new institutes may be required, old ones may become obsolete and other organizational changes in the NIST may be required. Such changes can be made through a formal 60-day notification to the Congress under this section or can be proposed in the NIST's annual budget request.

Section 108

In this section an Advanced Technology Board with majority representation from U.S. industry replaces the Visiting Committee as the statutory advisory committee for the Institutes. A board such as this would have the practical ability to understand the various technical breakthroughs and how these breakthroughs might affect different industrial sectors. For example, this Board could be an important bridge between the federal research and development agencies involved in biotechnology (such as the Departments of Commerce, Agriculture, Health and Human Services and the National Science Foundation) and Industries investing in biotechnology. The length of term for the Advanced Technology Board Members is three years and at least five of the nine Board Members must be representatives from industry.

The provision is designed to ensure that a constant supply of new ideas are available to the Board and that the policies of the Board clearly reflect the best thinking and market sense of the industries that will utilize the technologies and processes that are made available through the Foundation.

Section 109

This section requires the Institutes to develop a plan for expanding the Energy-related Inventions Program, which now reviews only energy-related inventions. The existing program created by P.L. 93-577 has been highly successful in rigorously evaluating inventions and enabling those which are approved to obtain financing more readily. The Committee believes this excellent service should be extended to include inventions that are not energy-relat-

ed. The Institutes' plan is to include specific timetables for implementing the expansion as well as proposed mechanisms to help fund further development of the approved projects.

Section 110

This section authorizes \$10,000,000 to be appropriated for NIST's functions other than those contained in Section 105. The Section 105 authorization for appropriations was provided for earlier this year in H.R. 2160, the National Bureau of Standards Authorization Act for FY 1988. Therefore, it is expected that the \$10,000,000 appropriation will be used principally for first-year funding for the Advanced Technology Foundation.

TITLE II

This title is based on the text of H.R. 2492, the Federal Industrial Extension Act of 1987, introduced by Congressmen Boehlert and MacKay. This title provides for the Secretary of Commerce to study the need for a federal program in this area and provides authorization for appropriations for the study and in later years for a federal program, if necessary.

Section 201

This section establishes the "Federal Industrial Extension Act of 1987", as the short title for Title II.

Section 202

This section of findings emphasizes that state industrial extension programs have proved to be an effective means of modernizing small and medium-sized businesses and of disseminating federal research results. The section also notes that state programs which have involved universities, colleges, and technical institutes have been among the most successful.

Section 203

This section describes the purpose of the title which is to assess the need for a national program to provide technical and financial assistance to the States to enable them to provide technical services to industry. The Commerce Department is required to submit a comprehensive study of state extension services in February 1988. Based on the study, the Secretary is to submit recommendations on how the Federal Government might encourage the state programs and take greater advantage of them. The Committee amended the introduced bill to delete the creation of an Office of Extension Services for Industrial Competitiveness within the National Institutes. In addition, a three-year competitive grants program, which would have been established to help up to fifteen states create, improve or expand extension programs to serve as national models, was deleted.

Section 204

This section requires the Secretary of Commerce to conduct a nationwide study of current State industrial extension programs looking at the size, scope, past successes, and future plans of each

state's relevant programs. The Secretary also is required to assess the degree to which these state programs make use of the many federal programs which have been set up to provide technical assistance to business, to research, and to collect and disseminate research results. The Secretary is to solicit views on what additional federal information and technical assistance the state programs can use and on how the programs could become more effective agents for the broad dissemination and utilization within their borders of federal and federally funded research results. Along with the results the Secretary, by February 1, 1988, is to submit to the Congress his recommendations for changes in federal law and policy and for federal assistance in these areas. The Secretary may delegate and/or contract out any portion of the study.

Section 205

This section provides such sums as are necessary to conduct the study required in Section 204. It also provides an authorization of \$16 million a year for three years for potential future programs to assist state industrial extension services.

Section 206

This section defines the terms "state industrial extension program" and "Secretary".

TITLE III

This title provides for an in-depth review of research and development priorities in superconductors. It is derived from H.R. 2069, the Superconductivity Competition Act of 1987, introduced by Congressman Ritter.

Section 301

This section requires the President to appoint a National Commission on Superconductivity to review the state of superconductor research and related policy issues. The section does not specify the size of the commission but requires that the panel include representatives from various agencies of the Federal Government, industries, universities, national laboratories, and professional societies. The section further stipulates that the National Critical Materials Council shall be the coordinating body of the National Commission on Superconductivity. In addition, a report by the review panel is required to be submitted to the President and the Congress within six months, after enactment of the bill. High temperature superconductivity, because of the dramatic breakthroughs recently made in this area, warrants the attention that would result from having the President appoint a National Commission to monitor scientific advances in this critical new field, and to develop a coordinated national strategy.

TITLE IV

This title, the "Clearinghouse for State and Local Initiatives on Productivity, Technology, and Innovation", is based on H.R. 2219, the Competitiveness Enhancement Act of 1987, introduced by Representatives Schneider and Walgren.

Section 401

This section establishes a Clearinghouse for State and Local Initiatives in the Office of Productivity, Technology, and Innovation in the Department of Commerce. The Clearinghouse is to collect and disseminate information on federal, state, and local technology initiatives. The Clearinghouse is authorized to develop methodologies which the state and local governments can use to evaluate their own programs. The Clearinghouse, through the Secretary of Commerce, can advise other federal agencies on how to improve Federal assistance to State and local technology programs. Annual reports are required to be submitted to the Congress by the Secretary of Commerce, including recommendations to the President, to the Congress, and to federal agencies on the appropriate role in stimulating State and local efforts in this area. The cost of the program is \$0.5 million in FY 1988, \$1 million in FY 1989, and \$1.5 million in FY 1990.

TITLE V

This title, "Semiconductor Research and Development", is the text of H.R. 2191, the National Advisory Committee on Semiconductor Research and Development Act of 1987, introduced by Congressman Valentine.

This title would create a 13-member independent advisory body known as the National Advisory Committee on Semiconductors to monitor the semiconductor industry and recommend a national strategy to ensure U.S. competitiveness in the semiconductor industry.

Section 501

This section establishes "National Advisory Committee on Semiconductor Research and Development Act of 1987" as the short title for this title.

Section 502

This section sets out findings and purposes for the title. The findings point out that the semiconductor industry, which is important to high technology and defense industries, is threatened by foreign competition with heavy governmental involvement, but that U.S. governmental actions are fragmented. The purpose of the title is to establish the National Advisory Committee on Semiconductors (NACOS) with responsibility for devising and promulgating a national semiconductor strategy.

Section 503

This section creates NACOS as an independent advisory body in the executive branch.

Section 504

This section requires NACOS to collect data, identify components of a semiconductor strategy, establish priorities, assess governmental roles including national laboratory roles, and make recommendations regarding semiconductors to federal agencies, industry, and other affected parties. This section requires NACOS to assess the

appropriate role of the national laboratories in this effort. The Committee feels that the many resources of our national laboratories, universities, other private sector organizations, and public-private research entities should be available in the development of a successful national semiconductor strategy.

Section 505

This section sets out NACOS membership, staffing, and reporting requirements. Annual reports are required to be submitted to the President and the Congress on the Committee's activities.

Section 506

This section provides "such sums" authorization for NACOS for fiscal years 1988, 1989, and 1990.

TITLE VI

This title is based on H.R. 1964, the Metric Usage Act of 1987, introduced by Congressmen Brown and Ritter.

Section 601

This section establishes "The Metric Usage Act of 1987" as the short title for this title. The primary purpose of the metric title is to establish a policy that the Systeme International (SI) Metric system be the preferred system of weights and measures for United States trade and commerce and to bring the Federal Government into conformity with that policy.

Section 602

The findings contained in this section note that world trade is increasingly geared towards metric and that the U.S. as the only non-metric industrialized nation is often placed at a competitive disadvantage. The Federal Government has a responsibility to develop procedures and techniques to make it easier for U.S. industry to use metric and to gain substantial advantages for itself by using metric in its own operations.

Section 603

This is the policy section of the title. It designates the metric system as the preferred system of weights and measures for United States trade and commerce. This is in keeping with the policy of voluntary movement towards metric first established in the Metric Conversion Act of 1975 (P.L. 94-168) and in recognition that the United States can no longer ignore the fact that it, Burma, and Liberia are the only three nations not to endorse metric's use in commerce. It requires that each federal agency, to the extent feasible, begin operating in metric by 1992 while recognizing that exceptions or postponements of metric conversion may need to be made where an agency's conversion of a specific function or procurement to metric is likely to lead to significant loss of markets for U.S. firms or to cause significant inefficiencies. For instance, in an area where the world market is non-metric, it is likely to be impractical for the U.S. government to perform or procure in metric.

This section also establishes that the policy of the United States is to seek out ways to increase understanding of metric through educational information and guidance and in government publications. This section does not imply that grants programs are to be set up to ease conversion. Rather the policy established in this section recognizes that thoughtful use of metric in government publications and the willingness of agencies to share metric expertise when asked can make American industry more competitive in an increasingly metric world. This Act, also should not be construed as requiring the use of metric in non-business activities.

Section 604

This section sets up procedures for implementing the policy section.

The policy section of this title is to be implemented in a timely fashion with the private sector being integrally involved in the process. Problems with metric conversion in Australia, Canada, and Great Britain occurred almost exclusively when the government did not communicate well with the private sector. Metric conversion is not undertaken as an end in itself. It is only of value if it brings the United States into a more favorable position in world trade or simplifies the conduct of commerce within the country. In areas where business is now conducted exclusively in English units and no clear benefits are to be gained, it would be a mistake for the government to take the lead in metrication; such use of metric clearly is not the intent of the title and would be considered to be impractical and to cause significant inefficiencies within the scope of Section 3(2) of the Metric Conversion Act. Similarly, in areas such as flight control, where English units are the international norm, conversion is likely to be inappropriate. Agencies are also asked, in setting timetables, to be sensitive to an industry's ability to produce in metric. While the Committee wishes firm dates to be set, it does not wish for these dates to provide undue advantage to contractors from other countries which are ahead of the U.S. in metric conversion.

Implementation of the title is to be carried out agency by agency in accordance with agency implementation plans. The Interagency Committee for Metric Policy and its Metric Operating Committee are to be involved integrally in the development of plans to the extent that interagency coordination is appropriate and necessary. Industry, through companies, trade associations, and engineering and professional societies, must play a major role in the development of federal agency plans and the setting of timetables under these plans. The end of fiscal year 1992 is set as a goal by which the portions of federal metric conversion that do not prove difficult should have taken place. Each agency is to adopt metric in sensible stages. In some instances, adoption is likely to be too complicated to complete or perhaps even begin by that date. It is more important to undertake the transition at a practical pace rather than to meet an arbitrary deadline. However, by 1992, the target dates, which can be revised later if necessary, are to be in place for all candidate areas, or decisions are to have been made that an area is inappropriate now for conversion. At that point, the legislation provides for the Comptroller General to review the progress of the gov-

ernment in implementing the policy of this legislation and to make legislative and other recommendations for the next steps in the process.

TITLE VII

This title makes two adjustments to the Technology Transfer Act of 1986's changes in the Stevenson-Wydler Act of 1980, to conform the 1986 law's text with the Congressional intent at time of passage. It also adds a section related to competitiveness impact reviews.

The Committee added a section to Title VII in Subcommittee which would have included contractors running government-owned, contractor-operated laboratories (GOCOs) within the definition of contractors under the Bayh-Dole government patent policy law (P.L. 96-517 as amended). This amendment would have given these contractors title to the inventions coming out of the laboratories for purposes of licensing the inventions. The contractors would then reinvest in their laboratories licensing revenues in excess of inventor royalty shares and expenses. This amendment was withdrawn at Full Committee. This will permit the Committee on Science, Space, and Technology to work jointly with the Committee on the Judiciary in the development of separate legislation to solve problems of patent policy related to GOCOs.

Section 701

This section rewords Section 14(a)(4) of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3710), dealing with the licensing of inventions, to permit the patent licensing program of the National Technical Information Service to receive in a timely manner the revenues it needs to continue its traditional program of providing world-wide patent licensing services to other government agencies.

Section 702

This section rewords Section 11(e)(7)(A) of the 1980 Act concerning the Federal Laboratory Consortium, to adjust that organization's funding formula to ensure that the \$900,000 to \$1,000,000 per year the Congress originally intended for the Consortium's responsibilities under the 1986 Act is available.

Section 703

This section adds a provision to the Stevenson-Wydler Technology Innovation Act of 1980 which would require the Office of Productivity, Technology and Innovation (OPTI) of the Department of Commerce to analyze the concept of competitiveness impact reviews. The intent of competitiveness impact reviews is to help federal, state, and local governments to be more conscious of the impact of their actions on the ability of the U.S. to compete both domestically and internationally.

VII. COMMITTEE VIEWS

TECHNOLOGY TRANSFER STUDY

Committee View

The Committee believes some of the most promising advances in technology transfer are occurring at the state level. In particular, witnesses have testified that state industrial extension programs have been successful at bringing up-to-date scientific, technical and managerial information to small and medium-sized businesses.

States have organized these programs in a variety of ways under a variety of names, but their salient feature is direct contact between experts at solving industrial problems—often university faculty—and the men and women in business who can apply that expertise.

The Committee believes these state programs can contribute to the national interest by improving the productivity and profitability of American industry, and by increasing industrial use of the results of federal and federally-funded research.

However, the quality and size of current extension programs vary widely from state to state. The Committee is interested in determining what role, if any, the federal government should play in improving state extension programs to make them more effective agents for the transfers and application of federal research results.

The first step toward making that determination will be the comprehensive study outlined in Section 204(a). This study, which the Secretary of Commerce may contract out, should provide the Committee with a detailed description of current state extension programs, an evaluation of their success, and some sense of what the programs might do if they were able to expand.

Based on this information and on the Commerce Department experience in working with state technology programs over the past 25 years, the Secretary will provide the Committee with his view of what the federal role should be. Federal technical and financial assistance should be among the options considered by the Secretary.

The Committee intends to review the study and recommendations as part of its consideration of the fiscal year 1989 authorization for the National Institutes of Standards and Technology. The Commerce Department is prohibited from implementing any program to help state extension programs without giving 60 days notice to the Committee and its Senate counterpart.

REVIEW OF RESEARCH AND DEVELOPMENT PRIORITIES IN
SUPERCONDUCTORS*Committee View*

The Committee recognizes the recent breakthroughs in superconducting materials hold out the promise of extraordinary new products of great economic significance. These products will be the subject of intense international competition for lucrative world markets. Japan has already mounted a significant effort to develop new superconductivity materials and new products based on those materials.

The Committee believes a coordinated national strategy is needed to accelerate development of competitive U.S. superconductor products. A National Commission on Superconductivity can assist the Congress and the President in devising such a national strategy.

The National Critical Materials Council is appropriately suited to serve as the coordinating body of the National Commission on Superconductivity. The council's responsibilities and functions under the National Critical Materials Act of 1984 are consistent with the purpose of the National Commission on Superconductivity and will serve to enhance the ability of the Commission to report on methods of enhancing the research, development, and implementation of improved superconductor technologies in all major applications.

The membership of the Commission includes representatives of federal agencies and private sector organizations in order to draw upon all U.S. expertise regarding this technology, and also to promote collaborative efforts between industry, universities, and independent research organizations, and the Federal Government where necessary.

The speed at which science and technology advances take place in today's world requires a swift and thorough response by the United States; therefore, the statute requires the Commission to submit a report within six months.

CLEARINGHOUSE FOR STATE AND LOCAL INITIATIVES

Committee Views

States are undertaking a wide variety of initiatives to help industries become more productive and innovative. In addition to extension programs (discussed under Title II), states are setting up research parks, incubators, university research efforts and venture capital funds—to name just a few programs—to encourage the development and use of new technology.

The Committee believes that states could be even more effective agents of technological change if there were a central source of information on state efforts. The Committee views the creation of such an information source as an appropriate federal role—a conclusion shared by the President's Commission on Industrial Competitiveness (Young Commission).

The Clearinghouse for State and Local Initiatives on Productivity, Technology and Innovation is intended to serve that function. The Clearinghouse should build on the Office of Productivity, Technology and Innovation's (OPTI) experience in working with the states to collect and disseminate information on the full range of state and local programs to improve productivity, technology and innovation.

The Clearinghouse should draw on this information to suggest federal policies that would enhance the effectiveness of these state programs.

The Clearinghouse is also charged with developing methodologies to evaluate state programs, and may advise states and other entities as to which types of programs have been most effective.

The Committee emphasizes that the role of the Clearinghouse is to assist the states and federal agencies, not to prescribe programs for the states or to second-guess their decisions. The Committee believes the states are best able to design programs to help their industries.

COMPETITIVENESS IMPACT REVIEWS

Committee View

Section 703 requires the Office of Productivity, Technology, and Innovation (OPTI) of the Department of Commerce to analyze the concept of competitiveness impact reviews. The intent of such an analysis is to help government (Federal, state, and local) to be conscious of, identify, and evaluate the impact of their actions on the ability of the U.S. to compete both domestically and internationally in the commercialization of science and technology advances. Such an analysis would develop methods of identifying and evaluating commercialization impediments, such as legal, regulatory, and legislative impediments and barriers. A study of this concept should include options for what such reviews should entail, various methods of evaluating the impact of government actions on the commercialization and marketing of science and technology advances, and recommendations on how competitiveness impact reviews could be utilized.

The Committee recognizes the need to understand the mechanisms which promote or restrain the commercialization of science and technology advances. By supporting a study of the concept of competitiveness impact reviews, the Committee does not intend to promote additional regulatory measures or to affect laws which protect health, worker safety or the environment.

One example of the utility of a competitiveness impact review is in the area of biotechnology. Competitiveness impact reviews may be useful in ensuring that the Government analyzes the relationship between effective health, safety and environmental regulations, and timely and effective commercialization.

A competitiveness impact review could significantly strengthen the ability of American industry to work with the Federal Government and the University community in the translation of basic research to a commercial product. It would also ensure a greater understanding of the international legal, technical and regulatory framework by providing an opportunity to have scientists and emerging companies understanding the requirements for commercialization of products.

VIII. IMPACT ON INFLATION

In accordance with rule XI, clause 2(1)(4), of the Rules of the House of Representatives, this legislation is assessed to have no adverse inflationary effect on prices and costs in the operation of the national economy.

IX. COMMITTEE OVERSIGHT FINDINGS AND RECOMMENDATIONS

Pursuant to rule XI, clause 2(1)(3) of the Rules of the House of Representatives, under the authority of rule X, clause 2(b)(1) and

clause 3(f), the Committee's oversight findings and conclusions are reflected in the recommendations found in the present bill and report.

X. SUMMARY OF GOVERNMENT OPERATIONS COMMITTEE FINDINGS AND RECOMMENDATIONS

No findings and recommendations on oversight activity pursuant to rule X, clause 2(b)(2) and rule XI, clause 2(1)(3), of the Rules of the House of Representatives, have been submitted by the Committee on Government Operations for inclusion in this report.

XI. BUDGET ANALYSIS AND PROJECTION

H.R. 2916 provides no new budget authority or tax expenditures. Consequently, the provisions of section 308(a) of the Congressional Budget Act are not applicable.

XII. CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

U.S. CONGRESS,
CONGRESSIONAL BUDGET OFFICE,
Washington, DC, July 30, 1987.

Hon. ROBERT A. ROE,
Chairman, Committee on Science, Space, and Technology,
U.S. House of Representatives, Washington, DC.

DEAR MR. CHAIRMAN: The Congressional Budget Office has prepared the attached cost estimate for H.R. 2916, the Technology Competitiveness Act of 1987.

If you wish further details on this estimate, we will be pleased to provide them.

With best wishes,
Sincerely,

EDWARD M. GRAMLICH,
Acting Director.

CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

1. Bill number: H.R. 2916.
2. Bill title: Technology Competitiveness Act of 1987.
3. Bill status: As ordered reported by the House Committee on Science, Space, and Technology, July 23, 1987.
4. Bill purpose: The bill redesignates the National Bureau of Standards (NBS) as the National Institutes of Standards and Technology (NIST), and describes the purposes and functions of the new agency. It also establishes within the NIST an Advanced Technology Foundation, to foster technological development. The bill authorizes appropriations of \$10 million for new NIST activities, and it is expected that this appropriation will be used principally for start-up funding for the Advanced Technology Foundation. Other NIST activities would be funded through an authorization for appropriations that was provided for earlier this year in H.R. 2160, the National Bureau of Standards Authorization Act for Fiscal Year 1988.

H.R. 2916 also directs the Secretary of Commerce to undertake a study that examines current state industrial extension programs,

and to recommend the appropriate federal role in encouraging such programs. The bill authorizes such sums as may be necessary to conduct the study and up to \$16 million per year in fiscal years 1989, 1990, and 1991 to implement programs to assist state industrial extension.

A Clearinghouse for State and Local Initiatives on Productivity, Technology, and Innovation is established to serve as an information center for state and local technology initiatives. The bill authorizes appropriations of \$0.5 million for fiscal year 1988, \$1.0 million for fiscal year 1989, and \$1.5 million for fiscal year 1990 for the clearinghouse.

H.R. 2916 also establishes a National Advisory Committee on Semiconductors, to collect and analyze information on the semiconductor industry and recommend a national strategy to ensure U.S. competitiveness in the field. Such sums as may be necessary are authorized for fiscal years 1988, 1989, and 1990.

The bill also provides for the creation of a National Commission on Superconductivity, the establishment of the metric system as the preferred system of measurement for U.S. commerce and trade, and certain changes to the Stevenson-Wydler Act of 1980.

5. Estimated cost to the Federal Government:

[By fiscal year in millions of dollars]

	1988	1989	1990	1991	1992
NIST authorizations new activities:					
Authorization level.....	10.0				
Estimated outlays.....	4.9	4.1	0.7	0.3	
State industrial extension assistance:					
Authorization level.....	0.3	16.0	16.0	16.0	
Estimated outlays.....	0.2	12.4	15.7	16.0	4.0
Clearinghouse on State and local initiatives:					
Authorization level.....	0.5	1.0	1.5		
Estimated outlays.....	0.5	1.0	1.5		
National Commission on Superconductivity:					
Estimated authorization level.....	0.5				
Estimated outlays.....	0.5				
National Advisory Committee on Semiconductors:					
Estimated authorization.....	0.8	1.5	1.6		
Estimated outlays.....	0.8	1.5	1.6		
Total:					
Estimated authorization.....	12.1	18.5	19.1	16.0	
Estimated outlays.....	6.9	19.0	19.4	16.3	4.0

This estimate does not include the cost of federal agencies of adopting the metric system for use in procurements, grants, and other business-related activities, because that cost could not be estimated in the time available.

The costs of this bill fall within budget function 370.

Basis of estimate: This estimate assumes that the bill will be enacted prior to the beginning of fiscal year 1988 and that the full amounts authorized will be appropriated. The study of state industrial extension programs was assumed to be an inhouse project of the agency. Outlays for the new programs are based on historical spending patterns of similar programs. The estimated costs of the

National Advisory Committee on Semiconductors is based on the cost of similar advisory committees. Based on information from the Department of Commerce and on the cost of similar commissions, the National Commission on Superconductivity is expected to cost about \$500,000 in fiscal year 1988.

The bill would require that each federal agency, to the extent feasible by 1992, use the metric system in its procurements, grants, and other business-related activities, where appropriate. The traditional systems of weights and measures will be permitted in nonbusiness activities. CBO does not presently have sufficient information to estimate the cost of this requirement.

Other provisions of this bill are not expected to result in significant additional costs.

6. Estimated cost to State and local governments: None.

7. Estimate Comparison: None.

8. Previous CBO estimate: On June 18, 1987, CBO transmitted to the Senate Committee on Commerce, Science and Transportation, a cost estimate for S. 907, the Technology Competitiveness Act of 1987, as ordered reported by the Senate Committee on Commerce, Science and Transportation, June 16, 1987. The Senate bill includes authorizations for appropriations for all of the functions of the NIST, whereas the House bill includes authorization for appropriations for new activities of the NIST that were not included in the National Bureau of Standards Authorization Act for Fiscal Year 1988. The estimates also reflect differences between the two bills in other authorizations.

9. Estimate prepared by: Douglas Criscitello.

10. Estimate approved by: C.G. Nuckols (for James L. Blum, Assistant Director for Budget Analysis).

XIII. CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

In compliance with clause 3 of rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italic, existing law in which no change is proposed is shown in roman):

ACT OF MARCH 3, 1901

An Act To establish the National Bureau of Standards

* * * * *

[SEC. 2. The Secretary of Commerce (hereinafter referred to as the Secretary) is authorized to undertake the following functions:

[(a) The custody, maintenance, and development of the national standards of measurements, and the provision of means and methods for making measurements consistent with those standards, including the comparison of standards used in scientific investigations, engineering, manufacturing, commerce, and educational institutions with the standards adopted or recognized by the Government.

[(b) The determination of physical constants and properties of materials when such data are of great importance to scientific or

manufacturing interests and are not to be obtained of sufficient accuracy elsewhere.

[(c) The development of methods for testing materials, mechanisms, and structures, and the testing of materials, supplies, and equipment, including items purchased for use of Government departments and independent establishments.

[(d) Cooperation with other governmental agencies and with private organizations in the establishment of standard practices, incorporated in codes and specifications.

[(e) Advisory service to Government agencies on scientific and technical problems.

[(f) Invention and development of devices to serve special needs of the Government.

[In carrying out the functions enumerated in this section, the Secretary is authorized to undertake the following activities and similar ones for which need may arise in the operations of Government agencies, scientific institutions, and industrial enterprises:

[(1) the construction of physical standards;

[(2) the testing, calibration, and certification of standards and standard measuring apparatus;

[(3) the study and improvement of instruments and methods of measurements;

[(4) the investigation and testing of railroad track scales, elevator scales, and other scales used in weighing commodities for interstate shipment;

[(5) cooperation with the States in securing uniformity in weights and measures laws and methods of inspection;

[(6) the preparation and distribution of standard samples such as those used in checking chemical analyses, temperature, color, viscosity, heat of combustion, and other basic properties of materials; also the preparation and sale or other distribution of standard instruments, apparatus and materials for calibration of measuring equipment;

[(7) the development of methods of chemical analysis and synthesis of materials, and the investigation of the properties of rare substances;

[(8) the study of methods of producing and of measuring high and low temperatures; and the behavior of materials at high and at low temperatures;

[(9) the investigation of radiation, radioactive substances, and X-rays, their uses, and means of protection of persons from their harmful effects;

[(10) the study of the atomic and molecular structure of the chemical elements, with particular reference to the characteristics of the spectra emitted, the use of spectral observations in determining chemical composition of materials, and the relation of molecular structure to the practical usefulness of materials;

[(11) the broadcasting of radio signals of standard frequency;

[(12) the investigation of the conditions which affect the transmission of radio waves from their source to a receiver;

[(13) the compilation and distribution of information on such transmission of radio waves as a basis for choice of frequencies to be used in radio operations;

[(14) the study of new technical processes and methods of fabrication of materials in which the Government has a special interest; also the study of methods of measurement and technical processes used in the manufacture of optical glass and pottery, brick, tile, terra cotta, and other clay products;

[(15) the determination of properties of building materials and structural elements, and encouragement of their standardization and most effective use, including investigation of fire-resisting properties of building materials and conditions under which they may be most efficiently used, and the standardization of types of appliances for fire prevention;

[(16) metallurgical research, including study of alloy steels and light metal alloys; investigation of foundry practice, casting, rolling, and forging; prevention of corrosion of metals and alloys; behavior of bearing metals; and development of standards for metals and sands;

[(17) the operation of a laboratory of applied mathematics;

[(18) the prosecution of such research in engineering, mathematics, and the physical sciences as may be necessary to obtain basic data pertinent to the functions specified herein; and

[(19) the compilation and publication of general scientific and technical data resulting from the performance of the functions specified herein or from other sources when such data are of importance to scientific or manufacturing interests or to the general public, and are not available elsewhere, including demonstration of the results of the Bureau's work by exhibits or otherwise as may be deemed most effective, and including the use of National Bureau of Standards scientific or technical personnel for part-time or intermittent teaching and training activities at educational institutions of higher learning as part of and incidental to their official duties and without additional compensation other than that provided by law.]

SEC. 2. (a) There is established within the Department of Commerce and its National Institutes of Standards and Technology four science and technology laboratories, which shall be known as the National Engineering Institute, the National Measurement Institute, the Computer Sciences and Technology Institute, and the Materials Science and Engineering Institute (in this section collectively referred to as the "Institutes").

(b) The Institutes are authorized—

(1) to assist industry in the development of technology and procedures needed to improve quality, to modernize manufacturing processes, to ensure product reliability, manufacturability, functionality, and cost effectiveness, and to facilitate the more rapid commercialization, especially by small- and medium-sized companies throughout the United States, of products based on new scientific discoveries in fields such as automation, electronics, advanced materials, biotechnology, and optical technologies;

(2) to develop, maintain, and retain custody of the national standards of measurement, and provide the means and methods

for making measurements consistent with those standards, including comparing standards used in scientific investigations, engineering, manufacturing, commerce, industry, and educational institutions with the standards adopted or recognized by the Federal Government;

(3) to enter into contracts, including cooperative research and development arrangements, in furtherance of the United States industrial competitiveness;

(4) to provide United States industry, Government, and educational institutions with a national clearinghouse of current information, techniques, and advice for the achievement of higher quality and productivity;

(5) to assist industry in the development of measurements, measurement methods, and basic measurement technology;

(6) to determine, compile, evaluate, and disseminate physical constants and the properties and performance of conventional and advanced materials when they are important to science, engineering, manufacturing, education, commerce, and industry and are not available with sufficient accuracy elsewhere;

(7) to develop a fundamental basis and methods for testing materials, mechanisms, structures, equipment, and systems, including those used by the Federal Government;

(8) to assure the compatibility of United States national standards with those of other nations;

(9) to cooperate with other departments and agencies of the Federal Government, with industry, with State and local governments, and with private organizations in establishing standard practices, codes, specifications, and voluntary consensus standards;

(10) to advise government and industry on scientific and technical problems; and

(11) to invent, develop, and (when appropriate) promote transfer to the private sector of measurement devices to serve special national needs.

(c) In carrying out the functions specified in subsection (b), the Institutes may—

(1) construct physical standards;

(2) test, calibrate, and certify standards and standard measuring apparatus;

(3) study and improve instruments, measurement methods, and industrial quality control and quality assurance techniques;

(4) cooperate with the States in securing uniformity in weights and measures laws and methods of inspection;

(5) prepare, certify, and sell standard reference materials for use in ensuring the accuracy of chemical analyses and measurements of physical and other properties of materials;

(6) accept research associates, cash donations, and donated equipment from industry and also engage with industry in research to develop new basic and generic technologies for traditional and new products and for improved production and manufacturing;

(7) study and develop fundamental scientific understanding and improved measurement, analysis, synthesis, processing, and

fabrication methods for chemical substances and compounds, and all traditional and advanced materials, as a function of pressure, temperature, structure, and other appropriate parameters;

(8) investigate ionizing and nonionizing radiation and radioactive substances, their uses, and ways to protect people, structures, and equipment from their harmful effects;

(9) determine the atomic and molecular structure of matter, through analysis of spectra and other methods, to provide a basis for predicting chemical and physical structures and reactions and for designing new materials and chemical substances, including biologically active macromolecules;

(10) perform research on electromagnetic signals, including optical signals, and on properties and performance of electrical, electronic, and electromagnetic devices and systems and their essential materials, develop and maintain related standards, and disseminate standard signals through broadcast and other means;

(11) develop and test standard interfaces, communication protocols, and data structures for computer, automation, and telecommunications systems;

(12) study computer systems and their use to control machinery and processes;

(13) determine properties of building materials and structural elements, and encourage their standardization and most effective use, including investigation of fire-resisting properties of building materials and conditions under which they may be most efficiently used, and the standardization of types of appliances for fire prevention;

(14) undertake such research in engineering, pure and applied mathematics, statistics, computer science, materials science, and the physical sciences as may be necessary to carry out and support the functions specified in this section;

(15) investigate conditions which affect the transmission of radio waves from their source to a receiver and the compilation and distribution of information on such transmission of radio waves as a basis for choice of frequencies to be used in radio operations;

(16) compile, evaluate, publish, and otherwise disseminate general scientific and technical data resulting from the performance of the functions specified in this section or from other sources when such data are important to science, engineering, or industry, or to the general public, and are not available elsewhere;

(17) collect, create, analyze, and maintain specimens of scientific value;

(18) operate national user facilities;

(19) evaluate promising inventions and other novel technical concepts submitted by inventors and small companies and work with other Federal agencies, States, and localities to provide appropriate technical assistance and support for those inventions which are found in the evaluation process to have commercial promise;

(20) demonstrate the results of the Institutes' activities by exhibits or other methods of technology transfer, including the use of scientific or technical personnel of the Institutes for part-time or intermittent teaching and training activities at educational institutions of higher learning as part of and incidental to their official duties; and

(21) undertake such other activities similar to those specified in this subsection as the Director determines appropriate.

* * * * *

[SEC. 5. That the director shall be appointed by the President, by and with the advice and consent of the Senate. The Director shall have the general supervision of the bureau, its equipment, and the exercise of its functions. The Director shall make an annual report to the Secretary of the Treasury, including an abstract of the work done during the year and a financial statement. The Director may issue, when necessary, bulletins for public distribution, containing such information as may be of value to the public or facilitate the bureau in the exercise of its functions. The Director shall be compensated at the rate now or hereafter in effect for Level IV of the Executive Schedule under section 5315 of title 5, United States Code.]

SEC. 5. The Director shall be appointed by the President, by and with the advice and consent of the Senate. He shall have the general supervision of the National Institutes of Standards and Technology, their equipment, and the exercise of their functions. Before any person is appointed as Director, the President shall afford the Advanced Technology Board established by section 21 an opportunity to make recommendations with respect to such appointment. The Director shall make an annual report to the Secretary of Commerce, including an abstract of the work done during the year and a financial statement. He may issue, when necessary, bulletins for public distribution, containing such information as may be of value to the public or facilitate the exercise of the functions of the National Institutes.

* * * * *

[SEC. 10. That there shall be a visiting committee of five members, to be appointed by the Secretary of the Treasury, to consist of men prominent in the various interests involved, and not in the employ of the Government. This committee shall visit the bureau at least once a year, and report to the Secretary of the Treasury upon the efficiency of its scientific work and the condition of its equipment. The members of this committee shall serve without compensation, but shall be paid the actual expenses incurred in attending its meetings. The period of service of the members of the original committee shall be so arranged that one members shall retire each year, and the appointments thereafter to be for a period of five years. Appointments made to fill vacancies occurring other than in the regular manner are to be made for the remainder of the period in which the vacancy exists.]

* * * * *

SEC. 21. (a) There is established in the National Institutes of Standards and Technology, reporting to the Director, an Advanced Technology Foundation.

(b) The Foundation is authorized and directed—

(1) to sponsor programs of applied research with United States industry, universities, and independent research organizations to lay the groundwork for the development and use by United States industry of advanced and innovative manufacturing and process technologies for the purpose of ensuring that United States industries, including small businesses in those industries, are competitive in emerging high technology industries;

(2) to provide organizational and technical advice, and partial start-up funding where necessary to consortia, which may include United States industry, universities, and independent research organizations, aimed at solving generic problems of specific industries and making those industries more competitive in world markets;

(3) to provide technical assistance for, and to share in the costs of, collaborative technology demonstration projects managed by consortia of United States industry (which may include universities and independent research organizations), including the installation, testing, and modification of major prototype equipment or processes, or existing equipment or processes in new applications if such arrangements will benefit participating industries generally and will help increase their competitiveness in world markets;

(4) to carry out all functions, powers, duties, and responsibilities related to the Cooperative Research Centers created under section 6 of the Stevenson-Wydler Technology Innovation Act of 1980; and

(5) to involve the Federal laboratories in the programs of the Foundation, where appropriate, using among other authorities the cooperative research and development agreements provided for under section 12 of the Stevenson-Wydler Technology Innovation Act of 1980.

SEC. 22. (a) There is established within the National Institutes of Standards and Technology an Advanced Technology Board. The Board shall consist of 9 members, at least five of whom shall be from United States industry. They shall be appointed by the President, by and with the advice and consent of the Senate. In addition to any powers and functions otherwise granted to it by this Act, the Board shall review and make recommendations regarding general policy for the National Institutes of Standards and Technology, their organization, their budgets, and their programs within the framework of applicable national policies as set forth by the President and the Congress.

(b) The persons appointed as members of the Board (1) shall be eminent in the fields of business, labor, research, new product development, engineering, education, management consulting, environment, and international relations; (2) shall be selected solely on the basis of established records of distinguished service; (3) shall not be employees of the Federal Government; and (4) shall be so selected as to provide representation of a cross-section of the traditional and

emerging United States industries. The President is requested, in making appointments of persons as members of the Board, to give due consideration to any recommendations which may be submitted to him by the National Academies, professional societies, business associations, labor associations, and other appropriate organizations.

(c)(1) The term of office of each member of the Board, other than the original members, shall be 3 years; except that any member appointed to fill a vacancy occurring prior to the expiration of the term for which his predecessor was appointed shall be appointed for the remainder of such term. Any person who has been a member of the Board for 6 consecutive years shall thereafter be ineligible for appointment during the one-year period following the expiration of the 6th year.

(2) The original members of the Board shall be elected to 3 classes of 3 members each; one class shall have a term of 1 year, one a term of 2 years, and the other a term of 3 years.

(d) The Board shall meet at least quarterly at the call of the Chairman or whenever one-third of the members so request in writing. A majority of the members of the Board not having a conflict of interest in the matter being considered by the Board shall constitute a quorum. Each member shall be given appropriate notice, whenever possible, not less than 15 days prior to any meeting, of the call of such meeting.

(e) The Board shall have an executive committee, and may delegate to it or to the Secretary such of the powers and functions granted to the Board by this Act as it deems appropriate. The Board is authorized to appoint from among its members such other committees as it deems necessary, and to assign to committees so appointed such survey and advisory functions as the Board deems appropriate to assist it in exercising its powers and functions under this Act.

(f) The election of the Chairman and Vice Chairman of the Board shall take place at each annual meeting occurring in an even-numbered year. The Vice Chairman shall perform the duties of the Chairman in his absence. In case a vacancy occurs in the chairmanship or vice chairmanship, the Board shall elect a member to fill such vacancy.

(g) The Board may, with the concurrence of a majority of its members, permit the appointment of a staff consisting of not more than 4 professional staff members and such clerical staff members as may be necessary. Such staff shall be appointed by the Director of the National Institutes, after consultation with the Chairman of the Board, and assigned at the direction of the Board. The professional members of such staff may be appointed without regard to the provisions of title 5, United States Code, governing appointments in the competitive service and the provisions of chapter 51 of title 5 of such Code relating to classification, and compensated at a rate not exceeding the appropriate rate provided for individuals in grade GS-18 of the General Schedule under section 5332 of title 5 of such Code, as may be necessary to provide for the performance of such duties as may be prescribed by the Board in connection with the exercise of its powers and functions under this Act.

(h) *The Board is authorized to establish such special commissions as it may from time to time deem necessary for the purposes of this Act.*

(i)(1) *The Board shall render an annual report to the President, for submission to the Congress on or before January 31 in each year. Such report shall deal essentially, though not necessarily exclusively, with policy issues or matters which affect the National Institutes of Standards and Technology including the Advanced Technology Foundation or with which the Board in its official role as the private sector policy advisor of the National Institutes of Standards and Technology is concerned.*

(2) *The Board shall render to the President and the Congress such additional reports on specific policy matters as it deems appropriate.*

ACT OF JULY 16, 1914

An Act making appropriations for the legislative, executive, and judicial expenses of the Government for the fiscal year ending June thirtieth, nineteen hundred and fifteen, and for other purposes

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DEPARTMENT OF COMMERCE

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【Apprentices in the Bureau of Standards may be promoted after satisfactory apprenticeship, with the approval of the Civil Service Commission, to positions corresponding to the journeyman grades for which their duties logically prepare them without regard to ap-
proportionment: *Provided*, That they thus acquire no rights to transfer to other lines of work.】

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ACT OF MARCH 4, 1913

An Act making appropriations to provide for the expenses of the government of the District of Columbia for the fiscal year ending June thirtieth, nineteen hundred and fourteen, and for other purposes

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CONTINGENT AND MISCELLANEOUS EXPENSES

* * * * *

【Hereafter materials for fireproof buildings, other structural materials, and all materials, other than materials for paving and for fuel, purchased for and to be used by the government of the District of Columbia, when necessary in the judgment of the commissioners to be tested, shall be tested by the Bureau of Standards under the same conditions as similar testing is required to be done for the United States Government.】

* * * * *

ACT OF MAY 4, 1930

An Act authorizing the establishing of a national hydraulic laboratory in the Bureau of Standards of the Department of Commerce and the construction of a building therefor

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, [That there is hereby authorized to be established in the Bureau of Standards of the Department of Commerce a national hydraulic laboratory for the determination of fundamental data useful in hydraulic research and engineering, including laboratory research relating to the behavior and control of river and harbor waters, the study of hydraulic structures and water flow, and the development and testing of hydraulic instruments and accessories: *Provided*, That no test study or other work on a problem or problems connected with a project the prosecution of which is under the jurisdiction of any department or independent agency of the Government shall be undertaken in the laboratory herein authorized until a written request to do such work is submitted to the Director of the Bureau of Standards by the head of the department or independent agency charged with the execution of such project: *And provided further*, That any State or political subdivision thereof may obtain a test, study, or other work on a problem connected with a project the prosecution of which is under the jurisdiction of such State or political subdivision thereof.]

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STEVENSON-WYDLER TECHNOLOGY INNOVATION ACT OF 1980

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SEC. 4. DEFINITIONS.

As used in this Act, unless the context otherwise requires the term—

(1) * * *

* * * * *

(13) "*Clearinghouse*" means the *Clearinghouse for State and Local Initiatives on Productivity, Technology, and Innovation* established by section 5A.

SEC. 5. COMMERCE AND TECHNOLOGICAL INNOVATION.

(a) * * *

* * * * *

(c) DUTIES.—The Secretary, through the Assistant Secretary, on a continuing basis, shall—

(1) * * *

* * * * *

(7) *analyze the concept of competitiveness impact reviews to identify impediments, including legal, regulatory, and legislative impediments and barriers, to the commercialization of United States science and technology advances;*

[(7)] (8) encourage and assist the creation of centers and other joint initiatives by State or local governments, regional organizations, private businesses, institutions of higher education, nonprofit organizations, or Federal laboratories to encourage technology transfer, to stimulate innovation, and to promote an appropriate climate for investment in technology-related industries;

[(8)] (9) propose and encourage cooperative research involving appropriate Federal entities, State or local governments, regional organizations, colleges or universities, nonprofit organizations, or private industry to promote the common use of resources, to improve training programs and curricula, to stimulate interest in high technology careers, and to encourage the effective dissemination of technology skills within the wider community;

[(9)] (10) consider measures with the potential of advancing United States technological innovation and exploiting innovations of foreign origin; and

[(10)] (11) publish the results of studies and policy experiments.

(e) **REPORT**—The Secretary shall prepare and submit to the President and Congress, within 3 years after the date of enactment of this Act, a report on the progress, findings, and conclusions of activities conducted pursuant to sections 5, 6, 8, 11, 12, and 13 of this Act (as then in effect) and recommendations for possible modifications thereof, and shall issue additional reports whenever deemed appropriate. The Secretary shall submit the initial report regarding the analysis of competitiveness impact reviews required by subsection (c)(7) no later than September 30, 1988.

SEC. 5A. CLEARINGHOUSE FOR STATE AND LOCAL INITIATIVES ON PRODUCTIVITY, TECHNOLOGY, AND INNOVATION.

(a) **ESTABLISHMENT.**—There is established in the Office of Productivity, Technology, and Innovation a Clearinghouse for State and Local Initiatives on Productivity, Technology, and Innovation. The Clearinghouse shall serve as a central repository of information on initiatives by State and local governments to enhance the competitiveness of American businesses and industry through the stimulation of productivity, technology, and innovation and on Federal efforts to assist State and local governments to enhance competitiveness.

(b) **RESPONSIBILITIES.**—The Clearinghouse may—

(1) establish relationships with State and local governments, and regional and multistate organizations of such governments, which carry out such initiatives;

(2) collect information on the nature, extent, and effects of such initiatives, particularly information useful to Federal agencies, State and local governments, and businesses throughout the United States;

(3) disseminate information collected under paragraph (2) to Congress, Federal agencies, State and local government agencies, and the public through reports, directories, handbooks, conferences, and seminars;

(4) study ways in which Federal agencies, including Federal laboratories, can provide assistance to State and local governments to enhance the competitiveness of American business;

(5) make periodic recommendations to the Secretary of Commerce, and upon request to other Federal agencies, concerning modifications in Federal policies and programs which would improve Federal assistance to State and local technology programs;

(6) developing methodologies to evaluate State and local programs, and, when requested, advise State and local governments, and regional and multistate organizations of such governments, as to which programs are most effective in enhancing the competitiveness of American business through the stimulation of productivity, technology, and innovation; and

(7) make use of, and disseminate, the study required by section 204(a) of the Technology Competitiveness Act of 1987.

(c) **ANNUAL REPORT.**—The Secretary shall prepare and transmit to the Congress an annual report on initiatives by State and local governments to enhance the competitiveness of American businesses through the stimulation of productivity, technology, and innovation. The report shall include recommendations to the President, the Congress, and to Federal agencies on the appropriate Federal role in stimulating State and local efforts in this area.

(d) **AUTHORIZATION OF APPROPRIATIONS.**—To carry out this section, there are authorized to be appropriated \$500,000 for the fiscal year 1988, \$1,000,000 for the fiscal year 1989, and \$1,500,000 for the fiscal year 1990 and each succeeding fiscal year. Amounts appropriated under this subsection shall remain available until expended.

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SEC. 10. UTILIZATION OF FEDERAL TECHNOLOGY.

(a) * * *

* * * * *

(e) **ESTABLISHMENT OF FEDERAL LABORATORY CONSORTIUM FOR TECHNOLOGY TRANSFER.**—

(1) * * *

* * * * *

(7)(A) Subject to subparagraph (B), an amount equal to [0.005 percent of that portion of the research and development budget of each Federal agency that is to be utilized by] 0.008 percent of the budget of each Federal agency from any Federal source, including related overhead, that is to be utilized by or on behalf of the laboratories of such agency for a fiscal year referred to in subparagraph (B)(ii) shall be transferred by such agency to the National Bureau of Standards at the beginning of the fiscal year involved. Amounts so transferred shall be provided by the Bureau to the Consortium for the purpose of carrying out activities of the Consortium under this subsection.

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SEC. 13. DISTRIBUTION OF ROYALTIES RECEIVED BY FEDERAL AGENCIES.

(a) **IN GENERAL.**—

(1) * * *

* * * * *

(4) A Federal agency receiving royalties or other income as a result of invention management services performed for another Federal agency or laboratory under section 207 of title 35, United States Code, [shall] *may* retain such royalties or income to the extent required to offset the payment of royalties to inventors under clause (i) of paragraph (1)(A), costs and expenses incurred under clause (i) of paragraph (1)(B), and the cost of foreign patenting and maintenance for [such invention performed at the request of the other agency or laboratory] *any invention of the other agency*. All royalties and other income remaining after payment of the royalties, costs, and expenses described in the preceding sentence shall be transferred to the agency for which the services were performed, for distribution in accordance with clauses (i) through (iv) of paragraph (1)(B).

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METRIC CONVERSION ACT OF 1975

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SEC. 2. The Congress finds as follows:

(1) The United States was an original signatory party to the 1875 Treaty of the Meter (20 Stat. 709), which established the General Conference of Weights and Measures, the International Committee of Weights and Measures and the International Bureau of Weights and Measures.

(2) Although the use of metric measurement standards in the United States has been authorized by law since 1866 (Act of July 28, 1866; 14 Stat. 339), this Nation today is the only industrially developed nation which has not established a national policy of committing itself and taking steps to facilitate conversion to the metric system.

(3) *World trade is increasingly geared toward the metric system of measurement.*

(4) *Industry in the United States is often at a competitive disadvantage when dealing in international markets because of its cumbersome, nonstandard measurement system, and is sometimes excluded when it is unable to deliver goods which are measured in metric terms.*

(5) *The inherent simplicity of the metric system of measurement and standardization of weights and measures has led to major cost savings in certain industries which have converted to that system.*

(6) *The Federal Government has a responsibility to develop procedures and techniques to assist industry as it voluntarily converts to the metric system of measurement.*

(7) *The metric system of measurement can provide substantial advantages to the Federal Government in its own operations.*

[SEC. 3. It is therefore declared that the policy of the United States shall be to coordinate and plan the increasing use of the

metric system in the United States and to establish a United States Metric Board to coordinate the voluntary conversion to the metric system.】

SEC. 3. *It is therefore the declared policy of the United States—*

(1) *to designate the metric system of measurement as the preferred system of weights and measures for United States trade and commerce;*

(2) *to require that each Federal agency, by a date certain and to the extent feasible by the end of the fiscal year 1992, use the metric system of measurement in its procurements, grants, and other business-related activities, except to the extent that such use is impractical or is likely to cause significant inefficiencies or loss of markets to United States firms;*

(3) *to seek out ways to increase understanding of the metric system of measurement through educational information and guidance and in Government publications; and*

(4) *to permit the continued use of traditional systems of weights and measures in nonbusiness activities.*

* * * * *

SEC. 12. (a) *As soon as possible after the date of the enactment of this section, each agency of the Federal Government shall establish guidelines to carry out the policy set forth in section 3 (with particular emphasis upon the policy set forth in paragraph (2) of that section), and as a part of its annual budget submission for each fiscal year beginning after such date shall report to the Congress on the actions which it has taken during the previous fiscal year, as well as the actions which it plans for the fiscal year involved, to implement fully the metric system of measurement in accordance with that policy. Such reporting shall cease for an agency in the fiscal year after it has fully implemented its efforts under section 3(2). As used in this section, the term "agency of the Federal Government" means an Executive agency or military department as those terms are defined in chapter 1 of title 5, United States Code.*

(b) *At the end of the fiscal year 1992, the Comptroller General shall review the implementation of this Act as amended by the Metric Usage Act of 1987, and upon completion of such review shall report his findings to the Congress along with any legislative recommendations he may have.*

SEC. [12.] 13. *There are authorized to be appropriated such sums as may be necessary to carry out the provisions of this Act. Appropriations to carry out the provisions of this Act may remain available for obligation and expenditure for such period or periods as may be specified in the Acts making such appropriations.*

XIV. COMMITTEE RECOMMENDATION

H.R. 2916 was ordered favorably reported on July 23, 1987, by the Committee by voice vote, a quorum being present.

XV. ADDITIONAL VIEWS—H.R. 2916, THE TECHNOLOGY COMPETITIVENESS ACT OF 1987

The Technology Competitiveness Act of 1987, as reported by the Committee, is a major step toward helping the United States improve its competitive position in both domestic and foreign markets. We support the Committee's bill and, in particular, we commend the establishment of the Advanced Technology Foundation. The Foundation's focus on helping industry help itself to find solutions to generic technological problems is a step in the right direction.

Title II of the bill, the Federal Industrial Extension Act of 1987, is of serious concern to us. The provision in the legislation for a study of state technology programs is appropriate and could provide valuable information regarding successful methods used to encourage industrial use of technological advances and techniques to promote technology transfer. However, we object to the authorization of \$16 million for each of three fiscal years for a State industrial extension program not yet defined, nor justified at this time.

We supported an amendment, offered in Committee, to reduce the authorization to \$2 million for each of three fiscal years. Unfortunately, the amendment was not adopted. The \$2 million funding level proposed in our amendment is consistent with the authorization proposed for a similar provision in S. 907, the Pilot State Technology Extension Program. We support the Senate's funding level for this provision, but we support our Committee's language which provides for a study and recommendations by the Secretary of Commerce. We do not support the Senate's proposed Pilot State Technology Extension Program.

Authorizing \$48 million to assist states in establishing and improving industrial technology programs is not an appropriate federal role. In addition, many states are running budget surpluses while the federal budget deficit continues to soar. States are fiscally capable of funding their own programs. Further, it doesn't make sense to fund this provision of the bill at \$6 million a year more than the Advanced Technology Foundation, the heart of this legislation.

RON PACKARD.

DON RITTER.

F. JAMES SENSENBRENNER, Jr.

ADDITIONAL VIEWS TO H.R. 2916—TECHNOLOGY
COMPETITIVENESS ACT OF 1987

I am deeply concerned that, in its present form, H.R. 2916, the Technology Competitiveness Act of 1987, could ironically have a negative impact on United States industry and competitiveness. Specifically, language in Section 3 requires that "by a date certain and to the extent possible by the end of the fiscal year 1992, use the metric system of measurement in all its procurements, grants, and other business activities, except to the extent that such use is impractical or is likely to cause significant inefficiencies."

In my view, this section will put a significant and undue burden on many businesses, including the aerospace industry. The requirements imposed in this section could harm, rather than help America's competitiveness. Requiring companies with products that are supplied to the Federal Government to convert to the metric system could prove extremely expensive. An examination of the aerospace industry would show this to be true.

We in the Federal Government should not be in the position of telling industry what is in their own best interest. If the private sector believes that converting to the metric system will increase their ability to compete internationally, then they should be able to exercise that option free from government coercion. I strongly believe that a far better and more realistic approach is embodied in the following language which I offered at full committee markup:

- (1) the increasing use of the metric system has benefited the Nation over the last decade; and
 - (2) conversion to the metric system shall assist in reducing the trade deficit by making United States products more marketable in international trade, thereby preserving jobs, and bringing growth opportunities to the United States economy.
- (b) The Federal government shall reaffirm the national policy set forth in the Metric Conversion Act of 1975 (15 U.S.C. 205a et seq.) and initiate specific programs to speed conversion to the metric system of measurement as a means of reducing the United States trade deficit, including new initiatives in field of metric education.

This language is basically the same as the Metric Conversion Act of 1975. It clearly encourages usage of the metric system; however, it does not require industry to conform to what the Federal Government has mandated as in American industry's best interest.

TOM LEWIS.

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